

# specifications

project:

THE HOME DEPOT #0000

NWQ of NW 12<sup>th</sup> Street and Ronald Reagan Turnpike

Doral, Florida



prepared by:



WD PARTNERS

7007 DISCOVERY BLVD

DUBLIN, OH 43017

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**NOTICE:** To All Bidders of Record and Users of these Documents.

The Date noted on the Cover is the contractual date of the Contract Documents. The date on individual sections is the date of the latest revision, and is hereby superseded by the date indicated on the Cover

**Construction Specification****TABLE OF CONTENTS****TABLE OF CONTENTS****Division 0 - Contract Requirements**

Section	00000	04/02/18	Cover Sheet
Section	00001	12/23/05	Contract Date Clarification
Section	00010	04/02/18	Table of Contents
Section	00015	04/02/18	Project Directory
Section	00100	04/02/18	Invitation to Bid
Section	00110	04/02/18	Project Dates (Hard Copy)
Section	00200	05/14/08	Instructions to Bidders
Section	00400	04/02/18	Bid Proposal Form
Section	00500	01/27/14	Stipulated Sum Contract (HDSTIPSUM 01-27-2014)
Section	00700	04/11/12	General Conditions (HDGENCON 04-11-2012)
Section	00900	12/23/05	Soils Report
Section	00900-A	11/20/17	Final Geotech Report
Section	00900-B	11/27/17	Addendum to Final Geotech Report

**Division 1 - General Requirements**

Section	01000	09/21/11	Special Conditions
Section	01001	04/02/18	Special Conditions: Letter to Contractor
Section	01010	09/04/09	Furnished By Owner Items (FBO)
Section	01010-A	06/22/05	Contractor Information Form
Section	01010-B	06/22/05	Take-Off Confirmation Sheet
Section	01010-C	06/22/05	Confirmation of Shipment
Section	01010-D	06/22/05	Change to Materials Form
Section	01010-E	06/22/05	Returned Material
Section	01011	01/22/07	Special Purchase Program (SPP)
Section	01012	02/09/12	Preferred Purchasing
Section	01013	02/20/18	Fire – Security Alarm
Section	01200	02/09/07	Project Meetings
Section	01200	09/17/03	Project Meetings-Form A
Section	01200	09/17/03	Project Meetings-Form B
Section	01230	03/16/09	Alternates
Section	01300	02/28/14	Submittals
Section	01411	04/16/14	Testing and Inspection
Section	01425	09/01/01	Roofing Testing and Inspection Service
Section	01430	09/01/01	Surveying
Section	01500	09/21/11	Temporary Construction Facilities
Section	01630	09/01/01	Substitutions and Product Options
Section	01700	06/11/09	Project Closeout
Section	01730	09/01/01	Operations & Maintenance Data
Section	01800	03/11/05	Abbreviations & Definitions

**Division 2 – Site Work**

Section	02000	04/02/18	Site Work - Division of Responsibility
Section	02200	04/02/18	Earthwork
Section	02260	04/02/18	Modular Retaining Wall System
Section	02282	04/02/18	Termite Control
Section	02370	04/02/18	Erosion and Sedimentation Control (Including SWPPP)
Section	02513	04/02/18	Asphalt Concrete Paving
Section	02520	04/02/18	Portland Cement Concrete Paving
Section	02550	04/02/18	Site Utilities
Section	02580	04/02/18	Pavement Markings
Section	02721	04/02/18	Storm Drainage System
Section	02810	04/02/18	Fine Grading, Temporary Grassing and Erosion Control
Section	02920	04/02/18	Soil Preparation
Section	02930	04/02/18	Lawn and Sod
Section	02940	04/02/18	Landscape Planting
Section	02950	04/02/18	Trees, Shrubs, Vines and Groundcover
Section	02960	04/02/18	Landscape Irrigation

**Construction Specification****TABLE OF CONTENTS****Division 3 - Concrete**

Section	03131	10/10/17	Permanent Plastic Concrete Forming
Section	03150	10/10/17	(FBO) Slab on Ground Accessories (PNA)
Section	03300	10/10/17	Cast-In-Place Concrete
Section	03300-A	10/10/17	Concrete Mix Design Submittal Form
Section	03300-B	10/10/17	Pre-Concrete Construction Conference Agenda
Section	03360	10/10/17	Special Concrete Floor Finishes
Section	03390	10/10/17	Slab on Ground
Section	03470	10/11/17	Tilt-Up Panels
Section	03600	10/11/17	Non-Shrink Grout

**Division 4 - Masonry**

Section	04100	10/11/17	Mortar and Grout
Section	04200	10/11/17	Brick Masonry
Section	04230	10/11/17	Reinforced Unit Masonry

**Division 5 - Metals**

Section	05120	10/11/17	Structural Steel
Section	05210	10/11/17	(FBO) Steel Joist Girders (Vulcraft)
Section	05220	10/11/17	(FBO) Steel Joists (Vulcraft)
Section	05300	10/12/17	(FBO) Steel Deck (Vulcraft)
Section	05400	10/11/17	Cold Formed Metal Framing
Section	05501	10/11/17	Metal Fabrications
Section	05580	10/11/17	Sheet Metal Fabrications

**Division 6 - Wood and Plastics**

Section	06100	10/11/17	Rough Carpentry
Section	06402	10/11/17	Interior Architectural Woodwork

**Division 7 - Thermal and Moisture Protection**

Section	07180	10/11/17	Water Repellent
Section	07201	10/11/17	Building Insulation
Section	07240	10/11/17	Exterior Insulation and Finish Systems
Section	07406	10/11/17	Metal Roof and Wall Panels
Section	07460	10/11/17	Fiber Cement Panels
Section	07534	10/12/17	(FBO) Single Ply TPO Membrane Roofing
Section	07600	10/12/17	Flashing and Sheet Metal
Section	07620	10/12/17	(FBO) TPO Flashing and Sheet Metal
Section	07701	10/12/17	(FBO) Roof Hatch
Section	07720	10/12/17	(FBO) Manufactured Structural Roof Curbs
Section	07840	10/12/17	Firestopping
Section	07901	10/12/17	Joint Sealers/Fillers

**Division 8 - Doors and Windows**

Section	08110	10/12/17	(FBO) Hollow Metal Doors and Frames (DH Pace)
Section	08331	10/12/17	(FBO) Overhead Coiling Doors (Cornell)
Section	08412	10/12/17	Aluminum Entrances and Storefronts
Section	08425	10/12/17	(FBO) Automatic Sliding Doors (Stanley)
Section	08460	10/12/17	(FBO) Contractor Doors (Stanley)
Section	08620	10/12/17	Skylights
Section	08625	10/12/17	Heat and Smoke Vents
Section	08700	10/12/17	(FBO) Finish Hardware (DH Pace)
Section	08800	10/12/17	Glass and Glazing

**Division 9 - Finishes**

Section	09220	10/12/17	Portland Cement Plaster (Stucco)
Section	09260	10/12/17	Gypsum Drywall



**Construction Specification****TABLE OF CONTENTS**

Section	09300	03/08/18	Tile
Section	09510	10/12/17	Acoustical Ceilings
Section	09549	10/12/17	Exterior Linear Metal Soffit System
Section	09653	10/12/17	Vinyl Base
Section	09659	10/12/17	Tactile Warning Surfacing
Section	09790	10/12/17	Floor Striping
Section	09860	10/12/17	Graffiti Resistant Coating
Section	09900	10/12/17	(FBO) Painting (Behr)
Section	09900-A	10/12/17	Paint Take-Off Order Sheet
Section	09985	10/12/17	Fiberglass Reinforced Panels

**Division 10 - Specialties**

Section	10166	10/12/17	Toilet Partitions
Section	10350	10/12/17	Flagpoles
Section	10606	10/12/17	Chain Link Fencing and Gates
Section	10810	10/12/17	Toilet Accessories

**Division 11 - Equipment**

Section	11020	10/12/17	(FBO) Safes (SDS)
Section	11160	10/12/17	Loading Dock Equipment

**Division 12 - Furnishings (Not Used)****Division 13 - Special Construction**

Section	13070	10/11/17	Bullet Resistant Protection
Section	13125	10/13/17	(NIC) Portable and Mobile Buildings
Section	13128	10/12/17	(FBO) Garden Center Fabrications
Section	13700	02/28/14	(FBO) Closed Circuit Television (CCTV) (Tyco)
Section	13727	02/28/14	(FBO) Security Alarm System (Tyco)
Section	13900	10/11/10	Fire Protection and Fire Pump
Section	13905	01/11/13	(NIC) Fire Extinguishers

**Division 14 - Conveying Systems**

Section	14580	10/12/17	(FBO) Pneumatic Tube System (Aerocom)
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**Division 15 - Mechanical**

Section	15010	10/13/17	Mechanical General Requirements
Section	15050	04/23/02	Basic Materials and Methods
Section	15140	09/11/07	Supports and Anchors
Section	15250	09/11/07	HVAC Insulation
Section	15400	09/11/07	Plumbing
Section	15410	10/28/11	(SPP) Plumbing Fixtures
Section	15430	01/11/13	Above Ground Irrigation System
Section	15450	10/26/17	Rainwater Harvesting System
Section	15610	05/30/14	(FBO) Unit Heater (Lennox)
Section	15625	11/07/13	(FBO) Low Intensity Radiant Heaters (Lennox-Reznor)
Section	15730	08/13/14	(FBO) Rooftop Units (Lennox)
Section	15850	11/07/13	(FBO) Fans (Lennox-Greenheck)
Section	15880	09/11/07	Air Distribution
Section	15952	10/11/17	(FBO) Controls (Novar)
Section	15960	10/11/17	(FBO) Energy Management Controls and Commissioning
Section	15990	01/15/10	Test, Adjust and Balance

**Division 16 - Electrical**

Section	16010	09/01/01	General Provisions
Section	16015	09/01/01	Definitions
Section	16020	09/01/01	Work Included
Section	16025	09/01/01	Work Not Included

**Construction Specification****TABLE OF CONTENTS**

Section	16030	09/01/01	Tests
Section	16040	01/15/10	Identification
Section	16100	06/20/03	Basic Materials and Methods
Section	16101	09/01/01	Substitution Request Form
Section	16110	10/19/09	Raceways
Section	16111	04/24/09	(FBO) Track Busway
Section	16120	10/19/09	Wire and Cables
Section	16121	10/16/14	(FBO) Flexible Wiring System (Lithonia)
Section	16125	01/29/10	Low-Voltage Wiring
Section	16130	10/19/09	Outlet Boxes and Junction Boxes
Section	16140	04/01/14	Switches and Receptacles
Section	16150	09/01/01	Motors
Section	16235	07/16/10	(FBO) UPS System (APC)
Section	16289	07/16/10	TVSS System
Section	16400	01/15/10	(FBO) Service and Distribution (CPI)
Section	16410	06/23/04	Electrical Service
Section	16415	09/11/07	Primary Service
Section	16450	09/11/07	Grounding
Section	16500	10/16/14	(FBO) Lighting (Lithonia)
Section	16620	08/19/11	(FBO) Emergency Electrical Generating System (Nixon-Kohler)
Section	16625	08/19/11	(FBO) Automatic Load Transfer (Nixon-Kohler)
Section	16700	07/16/10	Communication System (Telephone)
Section	16710	07/16/10	(FBO) Information Transport System
Section	16715	02/14/08	(FBO) Television Equipment
Section	16720	02/20/18	(FBO) Fire Alarm System
Section	16727	02/20/18	(FBO) Security System
Section	16856	09/11/07	Electric Heating Cables

END OF SECTION

**THE HOME DEPOT****PROJECT ADDRESS:**NWQ of NW 12<sup>th</sup> Street and Ronald Regan Turnpike**DATE:**

04/02/18

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**OWNER REPRESENTATIVE:**Latas Riley – THD PM  
2455 Paces Ferry Rd. NW  
Atlanta, GA 30339  
770.384.4442

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**STORE PLANNER:**Jason Campfield - THD STORE PLANNER  
2455 Paces Ferry Rd. NW  
Atlanta, GA 30339  
770.384.4086

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**ARCHITECT / ENGINEER OF RECORD:**WD Partners  
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Dublin, OH 43017  
ATTN: David Drouhard  
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WD Partners

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**CIVIL ENGINEER:**Kimley Horn  
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**FIRE PROTECTION:**Telgian  
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**SITE DEVELOPMENT COORDINATOR:**Greenberg Farrow  
1430 W. Peachtree St.  
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ATTN: Ed Allen  
404.601.4000  
404.601.4000

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**PLANNING AND ZONING, BUILDING OFFICIAL,  
AND CITY ENGINEER:**Department of Regulatory and Economic Resources  
Herbert S. Saffir Permitting and Inspection Center  
11805 SW 26<sup>th</sup> Street  
Miami, FL 33175  
Tel: (786)-315-2000

<b>HEALTH DEPARTMENT:</b>	FIRM NAME Firm Address Firm City, State and Zip ATTN: Tel: (000)-000-0000 Email:
<b>FIRE MARSHALL:</b>	FIRM NAME Firm Address Firm City, State and Zip ATTN: Tel: (000)-000-0000 Email:
<b>ELECTRIC:</b>	FIRM NAME Firm Address Firm City, State and Zip ATTN: Tel: (000)-000-0000 Email:
<b>GAS:</b>	FIRM NAME Firm Address Firm City, State and Zip ATTN: Tel: (000)-000-0000 Email:
<b>TELEPHONE:</b>	FIRM NAME Firm Address Firm City, State and Zip ATTN: Tel: (000)-000-0000 Email:
<b>WATER:</b>	FIRM NAME Firm Address Firm City, State and Zip ATTN: Tel: (000)-000-0000 Email:
<b>STORM AND SANITARY SEWERS:</b>	FIRM NAME Firm Address Firm City, State and Zip ATTN: Tel: (000)-000-0000 Email:

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**BID PACKAGE COVER LETTER****04/02/18**

You are hereby invited to submit bids for the work entitled:

**Store #0000****Doral, FL  
NWQ of NW 12th Street and Ronald Reagan Turnpike**

All bids will be received by e-mail and hard copy mailed (overnight) to the Home Depot Project Manager as specified in the Bid Package Cover Letter.

Please note that all bid documents remain the property of The Home Depot USA, Inc. and shall not be used for any purposes other than the entitled project.

The Owner intends to enter into a contract, "Home Depot Standard Form of Agreement between the Owner and Contractor-Stipulated Sum," which includes "The Home Depot U.S.A., Inc. General Conditions of the Contract for Construction" and other Bidding Documents required by the Project.

Please review the Invitation to Bid, Instructions to Bidder and the Bid Proposal Form carefully and notify this office IMMEDIATELY if for some reason you are unable to comply with the Bid Procedure in any way.

Questions regarding the Bid Documents must be forwarded to the Architect of Record through Expesite during business hours by no later than 72 hours prior to the actual Bid Date in order that addenda information can be released to bidders in a timely fashion.

Bids will be opened privately. The Owner reserves the right to waive any and all bidding irregularities including the right to reject or accept any or all Bids. The Owner retains the right to delete, modify, or negotiate portions of the work.

The Contractor, as part of the Bid, shall fill out the Bid Proposal Form. If the Scope of Work and Building Cost Breakdown information are not provided, the Bid will NOT be considered. Upon Award of Contract, the successful Contractor shall complete the requirements of the Award as provided in the Instructions to Bidders, Addenda, Alternates and the Contract Documents.

The following Benchmark Schedule "Exhibit F" and specification section 00110 Project Dates is included with the Invitation to Bid and provides a basic overview of the proposed Schedule of Activities for the Project. This Schedule outlines the projected timeline for overall project completion and describes critical Benchmark/Milestone dates for the required coordination between the Owner and Contractor. The Contractor should incorporate these Owner Critical Benchmark/Milestone dates in the overall Project Construction Schedule to be presented at the Pre-Construction meeting.

**Project Team:**

Real Estate Manager: Chandler Johnson, The Home Depot

Project Manager: Latas Riley, The Home Depot

Architect: Chris Martin, WD Partners

Civil Engineer: Peter Van Rens, Kimley Horn

Site Development Coordinator: Ed Allen, Greenberg Farrow

END OF SECTION



## **EASTERN DIVISION**

### **Project Dates Doral, FL, Store Number #0000**

#### **BID SCHEDULE**

- E-mail Bids Due: 05/02/18 No later than 11:00 am (EST)  
E-mail Bids to: Allan\_Williams@homedepot.com  
Latas\_Riley@homedepot.com
- Bid Hard Copies Due: 05/03/18 No later than 5:00 pm (EST)  
Hard Copies sent to: Latas Riley  
2455 Paces Ferry Rd, NW  
Floor C-19  
Atlanta, GA 30339
- Award Bid: 05/04/18 at 2:00 pm (EST)

The following dates are for Contractor scheduling purposes:

- Building Foundation Start: 07/02/18
- Turnover: 01/14/19
- Grand Opening: 02/21/19

General Contractor is permitted to submit an alternate construction schedule for all phases of site work and/or building construction if a cost savings can be realized. Please include the proposed cost savings in the substitutions portion of the Bid Proposal Form when submitting bids along with the proposed alternate construction schedule.

Please review the Invitation to Bid, Instructions to Bidders and the Bid Proposal Form carefully and notify The Home Depot IMMEDIATELY if for some reason you are unable to comply with the bid procedure in any way.

Questions about the bid documents must be submitted to the Architect of Record via an RFI through Expesite by 04/26/18 at 11 am (EST), in order that addenda can be released to bidders in a timely fashion.

A Pre-Bid Conference will take place 04/18/18 at 1:30 pm (EST) on site. Complete information will be announced at a later date.

END OF SECTION

**The Home Depot U.S.A., Inc.  
Instructions to Bidders**



**Article 1 Definitions**

- 1.1 Bidding Documents include the Bidding Requirements and the proposed Contract Documents. The Bidding Requirements consist of the Invitation to Bid, Instructions to Bidders, Supplementary Instructions to Bidders, the Bid Form, and other sample bidding and contract forms. The proposed Contract Documents consist of the Form of Agreement between the Home Depot and Contractor, Conditions of the Contract (General, Supplementary and Other Conditions), Drawings, Specifications and all Addenda issued prior to execution of the Contract.
- 1.2 Definitions set forth in the General Conditions of the Contract for Construction or in other Contract Documents are applicable to the Bidding Documents.
- 1.3 Addenda are written or graphic instruments issued by the Architect or Home Depot prior to the execution of the contract that modify or interpret the Bidding Documents by additions, deletions, clarifications or corrections.
- 1.4 A Bid is a complete and properly executed proposal to do the Work for the sums stipulated herein, submitted in accordance with the Bidding Documents.
- 1.5 The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents as the base, to which Work may be added or from which Work may be deleted for sums stated in Alternate Bids.
- 1.6 An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from the amount of the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.
- 1.7 A Unit Price is an amount stated in the Bid as a price per unit of measurement for materials, equipment or services or a portion of the work as described in the Bidding Documents.
- 1.8 A Bidder is a person or entity that submits a Bid who meets the requirements set forth in the Bidding Documents.
- 1.9 A Sub-bidder is a person or entity that submits a bid to a Bidder for materials, equipment, or labor for a portion of the Work.

**Article 2 Bidder's Representations**

- 2.1 Bidder by making a Bid represents that:
  - 2.1.1 The Bidder has read and understands the Bidding Documents and Contract Documents, to the extent that such documentation relates to the Work for which the Bid is submitted, and for other portions of the Project, if any, being bid concurrently or presently under construction.
  - 2.1.2 The Bid is made in full compliance with the Bidding Documents.
  - 2.1.3 The Bidder has visited the site, has become familiar with the local conditions under which the Work is to be performed and has correlated the Bidder's personal observations with the requirements of the proposed Contract Documents.
  - 2.1.4 The Bid is based upon the materials, equipment, and systems required by the Bidding Documents without exception.
  - 2.1.5 Bidder has carefully examined the Contract Documents and the job site, and that the Bidder is thoroughly familiar with the nature and location of the Work, the job site, the specific conditions under which the Work is to be performed, and all matters which may in any way affect the Work or its performance. The Bidder fully represents that as a result of such examinations and investigations, the Bidder thoroughly understands the Contract Documents and their intent and purpose, and is familiar with all applicable codes, ordinances, laws, regulations and rules as they apply to the Work, and that the Bidder will abide by same.
  - 2.1.6 The Bidder hereby specifically acknowledges that Contract Documents are complete and sufficient to have enabled it to determine the cost of the Work and that the Drawings, the Specifications and all addenda are sufficient to enable the Bidder to construct the Work outlined therein.

**Article 3 Bidding Documents****3.1 Copies**

The Architect of Record shall post to Expesite a complete set of drawings in Portable Document Format (PDF) for use by the Bidder. Any hard copies of Bidding Documents or drawings required by the Bidder shall be the Bidder's responsibility and expense. All Bid Documents remain the property of Home Depot and shall not be used for any other purpose than the bid.

- 3.1.1 Bidding Documents will not be issued directly to Sub-bidders unless specifically offered in the Invitation to Bid, or in supplementary instructions to Bidders.

- 3.1.2 Bidders shall use complete sets of Bidding Documents when preparing Bids. Neither the Home Depot nor Architect assumes responsibility for errors or misinterpretations resulting from the use of the Bidding Documents.
- 3.1.3 The Home Depot and Architect may make copies of the Bidding Documents available on the above terms for the purpose of obtaining Bids on the Work. No license or grant of use is conferred by issuance of copies of the Bidding Documents.

**3.2 Interpretation or Correction of Bidding Documents**

- 3.2.1 The Bidder shall carefully study and compare the Bidding Documents with each other, and with other work being bid concurrently or presently under construction to the extent that it relates to the Work for which the Bid is submitted, shall examine the site and local conditions, and shall at once report to the Architect and Home Depot in writing errors, inconsistencies or ambiguities that exist.
- 3.2.2 Bidders and Sub-bidders requiring clarification or interpretation of the Bidding Documents shall submit an RFI through Exesite which shall be received by the Architect at least 72 hours prior to the date for receipt of Bids.
- 3.2.3 Interpretations, corrections, and changes to the Bidding Documents will be made by Addendum. Interpretations, corrections, and changes of the Bidding Documents made in any other manner will not be binding, and Bidders shall not rely upon them.

**3.3 Design Bulletin Modifications reflected in Bid**

- 3.3.1 The most recent Design Bulletin document, which itemizes recent prototypical design modifications, has been included at the end of this section for reference. This Design Bulletin document has been included to assist the Bidder in isolating and identifying specific prototypic design modifications in order to give the Bidder the ability to provide a more accurate Bid.  
**Note: This Design Bulletin document includes design modifications that may or may not be included in this Bidding Document and shall not be included in this Bid unless included in this specific Bidding Documents.**

**3.4 Substitutions**

- 3.4.1 The materials, products, and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance, and quality to be met by any proposed substitutions.
- 3.4.2 No substitution will be considered prior to receipt of Bids unless the Architect has received an RFI through Exesite at least 72 hours prior to the date for receipt of Bids. Such requests shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitution including drawings, performance and test data, and other information necessary for an evaluation. A statement setting forth changes in other materials, equipment, or other portions of the Work, including changes in the work of other contracts that incorporation of the proposed substitution is upon the proposing party. Home Depot's decision of approval or disapproval of a proposed substitution shall be final.
- 3.4.3 If Home Depot approves a proposed substitution prior to the receipt of Bids, such approval will be set forth in an Addendum. Bidders shall not rely on approvals made in any other manner.
- 3.4.4 No substitution will be considered after the Contract award unless specifically provided for in the Contract Documents.

**3.5 Addenda**

- 3.5.1 Addenda will be transmitted via Exesite to all who are known by the Home Depot or Architect to have received a complete set of Bidding Documents.
- 3.5.2 Copies of Addenda will be made available for inspection wherever Bidding Documents are on file for that purpose.
- 3.5.3 Each bidder shall ascertain prior to submitting a Bid that the Bidder has received all Addenda issued, and the Bidder shall acknowledge their receipt in the Bid.

**Article 4 Bidding Procedures****4.1 Preparation of Bids**

- 4.1.1 Bids shall be submitted on the form included with the Bidding Documents via mail as well as e-mail to The Home Depot Project Manager and others as specified.
- 4.1.2 All blanks on the Bid Form shall be legibly executed in a non-erasable medium.
- 4.1.3 Sums shall be expressed in both words and figures. In case of discrepancy, the amount written in words shall govern.
- 4.1.4 The signer of the Bid must initial interlineations, alterations, and erasures.

- 4.1.5 All requested Alternates must be bid. If no change in the Base Bid is required, enter "No change."
- 4.1.6 Each copy of the Bid shall state the legal name of the Bidder and nature of legal form of the Bidder. The Bidder shall provide a copy of a business license and a state issued contractors license (if required by the state) in order to perform construction the within the jurisdiction of the Work. Each copy shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A bid by a corporation shall further give the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent will have a current Power of Attorney attached certifying the agent's authority to bind the Bidder.

## **Article 5**

### **5.1 Acceptance of Bid (Award)**

- 5.1.1 It is the intent of the Home Depot to award a Contract to the lowest, qualified, responsive and responsible Bidder, provided the Bid has been submitted in accordance with the requirements of the Bidding Documents, does not exceed the funds available, and is otherwise acceptable to Home Depot in all respects. Home Depot reserves the right to waive informalities and irregularities in a Bid received, and to accept any Bid or reject any and all Bids which, in the Home Depot's judgment, is in the Home Depot's best interests.
- 5.1.2 The Home Depot shall have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the Bidding Documents, and to determine the lowest, qualified, responsive, and responsible Bidder on the basis of the sum of the Base Bid and Alternates accepted.

## **Article 6 Post Bid Information**

### **6.1 Contractor's Qualification Statement**

Bidders to whom award of a Contract is under consideration shall submit to the Home Depot and Architect, upon request, a properly executed Contractor's Qualification Statement, a corporate résumé, and a current and complete audited financial statement, unless such information has been previously required and submitted as a prerequisite to the issuance of Bidding Documents.

### **6.2 Submittals**

- 6.2.1 The Bidder shall, as soon as practicable or as stipulated in the Bidding Documents, after notification of selection for the award of a Contract, furnish to the Home Depot in writing:
1. A designation of the Work to be performed with the Bidder's own forces;
  2. Names of the manufacturers, products, and the suppliers of principal items or systems of materials and equipment proposed for the Work; and
  3. Names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for the principal portions of the Work.
- 6.2.2 The Bidder will be required to establish to the satisfaction of the Architect and Home Depot the reliability and responsibility of the persons or entities proposed to furnish and perform the Work described in the Bidding Documents.
- 6.2.3 The Architect or Home Depot will notify the Bidder as soon as reasonably practicable if either the Home Depot or Architect, after due investigation, has reasonable objection to a person or entity proposed by the Bidder. If the Home Depot or Architect has reasonable objection to a proposed person or entity, the Bidder shall submit an acceptable substitute person or entity. If an adjustment in the Base bid or Alternate Bid to cover the difference in cost occasioned by such substitution is necessary, Bidder shall advise Home Depot and Architect of such proposed adjustment in writing. The Home Depot may accept the adjusted Bid Price or disqualify or terminate the Bidder. In the event of either withdrawal or disqualification, Bid security will not be forfeited.
- 6.2.4 Person and entities proposed by the Bidder and to whom the Home Depot and Architect have made no reasonable objection must be used on the Work for which they were proposed and shall not be changed except with the written consent of the Home Depot and Architect.

## **Article 7 Performance Bond and Payment Bond**

### **7.1 Bond Requirements**

- 7.1.1 If stipulated in the Bidding Documents, the Bidder shall furnish bonds covering the faithful performance of the Contract and payment of all obligations arising therein. Bonds may be secured through the Bidder's usual sources.
- 7.1.2 If the furnishing of such bonds is stipulated in the Bidding Documents, the cost shall be included in the Bid. If the

furnishing of such bonds is required after receipt of Bids and before execution of the Contract, the cost of such bonds shall be a pass through cost and will not be used in determining the Contract Sum.

- 7.1.3 If the Home Depot requires the bonds be secured from other than the Bidder's usual sources, changes in cost will be adjusted as provided in the Contract Documents.

**7.2 Time of Delivery and Form of Bonds**

- 7.2.1 The Bidder shall deliver the required bonds to the Home Depot not later than three days following the date of execution of the Contract. If the Work is to be commenced prior thereto in response to a letter of intent, the Bidder shall, prior to commencement of the Work, submit evidence satisfactory to the Home Depot that such bonds will be furnished and delivered in accordance with this Subparagraph 7.2.1.
- 7.2.2 Unless otherwise provided, the bonds shall be written on AIA Document A312, Performance Bond and Payment Bond. Both Bonds shall be written in the amount of the Contract Sum.
- 7.2.3 The bonds shall be dated on or after the date of the Contract.
- 7.2.4 The Bidder shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of the power of attorney.

**Article 8 Form of Agreement Between Home Depot and Contractor**

Unless otherwise required in the Bidding Documents, the Agreement for the Work will be written on the Home Depot's standard form of Agreement Between Home Depot and Contractor Stipulated Sum (HDSTIPSM).

END OF DOCUMENT

**BID PROPOSAL FORM**

1. TO: \_\_\_\_\_

2. HAVING READ THE SPECIFICATIONS AND EXAMINED THE DRAWINGS ENTITLED

HOME DEPOT: STORE NO.: 0000  
NWQ of NW 12th Street and Ronald Reagan Turnpike  
Doral, FL

DRAWING NOS: \_\_\_\_\_

DATED: \_\_\_\_\_

AND ADDENDA NOS.: \_\_\_\_\_

PREPARED BY: WD Partners  
7007 Discovery Blvd.  
Dublin, OH 43017

FOR THE CONSTRUCTION OF SAID PROJECT AND HAVING INSPECTED THE SITE FOR THE CONDITIONS AFFECTING AND GOVERNING THE CONSTRUCTION OF THE SAID PROJECT, THE UNDERSIGNED,

\_\_\_\_\_  
HEREBY PROPOSES TO FURNISH ALL LABOR, MATERIALS, TOOLS, EQUIPMENT, SUPERVISION, AND SERVICES REQUIRED FOR THE COMPLETION OF ALL OF THE WORK AS SHOWN ON THE DRAWINGS AND REQUIRED BY THE SPECIFICATIONS AND OTHER DOCUMENTS RELATING TO THE WORK FOR THE FOLLOWING SUMS.

AND SERVICES REQUIRED FOR THE COMPLETION OF ALL OF THE WORK AS SHOWN ON THE DRAWINGS AND REQUIRED BY THE SPECIFICATIONS AND OTHER DOCUMENTS RELATING TO THE WORK FOR THE FOLLOWING SUMS.

3. BIDDERS SHALL FILL IN ALL BLANKS HEREINAFTER FOR WHICH BID IS BEING SUBMITTED. BIDS SUBMITTED WITHOUT ALL DESIGNATED INFORMATION WILL BE CAUSE FOR REJECTION.

A. COMBINED GENERAL CONSTRUCTION CONTRACT (Write in the Sum and Figures)

TOTAL FOR THE SUM OF:

\_\_\_\_\_ DOLLARS (\$ \_\_\_\_\_)

B. PERFORMANCE AND PAYMENT BOND:

TOTAL FOR THE SUM OF:

\_\_\_\_\_ DOLLARS (\$ \_\_\_\_\_)

4. BIDDER PROPOSES TO AWARD SUBCONTRACTS FOR THE FOLLOWING PORTIONS OF THE WORK, THE AMOUNTS OF WHICH ARE INCLUDED IN THE AFOREMENTIONED LUMP SUM BID:

## SUBCONTRACTOR

GRADING	\$ -	
PAVING	\$ -	
STORM DRAINS	\$ -	
SEWER	\$ -	
WATER	\$ -	
GAS	\$ -	
PAVEMENT MARKINGS	\$ -	
CONCRETE	\$ -	
TRAFFIC SIGNALS/STREET LIGHTS	\$ -	
LANDSCAPE	\$ -	
TRAFFIC CONTROL	\$ -	
GENERAL CONDITIONS	\$ -	
OVERHEAD AND PROFIT	\$ -	
<b>Off-Site Subtotal:</b>	\$ -	

**SUBCONTRACTOR**

DEMOLITION	\$	-	
EARTHWORK	\$	-	
ROCK EXCAVATION	\$	-	
MODULAR RETAINING WALL SYSTEM	\$	-	
TERMITE CONTROL	\$	-	
DRILLED PIERS	\$	-	
ASPHALT CONCRETE PAVING	\$	-	
CONCRETE PAVING/CURBS/GUTTERS	\$	-	
STORM DRAIN	\$	-	
SEWER	\$	-	
WATER	\$	-	
GAS	\$	-	
PAVEMENT MARKINGS/SIGNS	\$	-	
SITE ELECTRICAL	\$	-	
LANDSCAPE	\$	-	
GENERAL CONDITIONS	\$	-	
OVERHEAD AND PROFIT	\$	-	
<b>On-Site Subtotal:</b>	\$	-	

**SUBCONTRACTOR**

CAST IN PLACE CONCRETE	\$ -	
CONCRETE WALL PANELS	\$ -	
MASONRY	\$ -	
STRUCTURAL STEEL	\$ -	
ROOF STEEL/DECKING ERECTION (MAIN BLDG.)	\$ -	
STEEL JOIST ERECTION (CANOPIES)	\$ -	
STANDING SEAM METAL ROOFING	\$ -	
COLD FORMED METAL FRAMING	\$ -	
ROOFING	\$ -	
METAL	\$ -	
WOOD & PLASTICS	\$ -	
THERMAL & MOISTURE PROTECTION	\$ -	
DOORS & WINDOWS	\$ -	
FINISHES	\$ -	
SPECIALTIES/EQUIPMENT	\$ -	
FIRE PROTECTION	\$ -	
PLUMBING	\$ -	
MECHANICAL	\$ -	
ELECTRICAL	\$ -	
GENERAL CONDITIONS	\$ -	
OVERHEAD AND PROFIT	\$ -	
<b>Building Sub-Total</b>	<b>\$ -</b>	

**PROJECT TOTAL:**

\$ -

## ALTERNATES

1.	GENERAL CONDITIONS (WEEKLY COST)	\$	-
2.	PARKING LOT CONCRETE PAVING	\$	-
3.		\$	-
4.		\$	-
5.		\$	-
6.		\$	-

**TOTAL WITH ALTERNATES:**

§ -

## 5. UNIT PRICES

THE ATTACHED "STIPULATED SUM CONTRACT EXHIBIT B - UNIT PRICING" MUST BE COMPLETED AND SUBMITTED AS PART OF THIS BID PROPOSAL FORM. CONTRACTOR UNDERSTANDS THE PRICES ARE ALL INCLUSIVE OF MATERIALS, LABOR, EQUIPMENT, TAXES, FUELS, CONSUMABLES AND ALL ASSOCIATED COSTS OF ANY TYPE, AND SHALL HOLD FOR THE DURATION OF THE PROJECT.

## 6. SUBSTITUTIONS

BIDDER IS CAUTIONED TO BID ON THE "STANDARDS" SPECIFIED AND TO ENTER ALL MATERIALS WHICH THE BIDDER WISHES TO HAVE CONSIDERED FOR **POSSIBLE SUBSTITUTIONS.**

THE FOLLOWING SUBSTITUTIONS FROM THE "STANDARDS" SPECIFIED ARE LISTED HEREIN FOR CONSIDERATION, AND, IF ACCEPTED, THE CONTRACT SUM MAY BE ADJUSTED IN ACCORDANCE WITH THE FOLLOWING:

ITEM	ADD	DEDUCT
1) _____	\$ -	\$ -
2) _____	\$ -	\$ -
3) _____	\$ -	\$ -
4) _____	\$ -	\$ -
5) _____	\$ -	\$ -
6) _____	\$ -	\$ -

## 7. ACKNOWLEDGEMENT BY BIDDER

THE UNDERSIGNED AGREES THAT THE ABOVE PRICES SHALL HOLD FOR SIXTY (60) DAYS AFTER RECEIPT OF PROPOSALS BY THE OWNER. THE UNDERSIGNED ACKNOWLEDGES ACCEPTANCE OF ALL PROVISIONS OF THE "GENERAL CONDITIONS", THE "INVITATION TO BID", THE "INSTRUCTIONS TO BIDDERS", ALL REQUIREMENTS FOR BID SECURITIES AND BONDS, AND ALL REQUIREMENTS FOR GUARANTEES AND WARRANTIES AS WRITTEN. THE "GENERAL CONDITIONS" ARE NOT NEGOTIABLE.

## 8. COMMENCEMENT OF WORK

THE CONTRACTOR SHALL COMMENCE WORK WITHIN SEVEN (7) CALENDAR DAYS OF DATE OF NOTICE TO PROCEED AND SHALL CARRY ON HIS OPERATION IN SUCH MANNER AS TO CAUSE THE LEAST POSSIBLE INCONVENIENCE TO THE OWNER, WITH LEAST DELAY IN PROSECUTION OF THE WORK.

COMMENCEMENT OF SITE WORK: \_\_\_\_\_

COMMENCEMENT OF BUILDING: \_\_\_\_\_

## 9. TIME OF COMPLETION:

SUBSTANTIAL COMPLETION: \_\_\_\_\_

(SUNDAYS AND HOLIDAYS INCLUDED) FROM DATE OF NOTICE TO PROCEED FROM OWNER. CONTRACTOR SHALL NOTE THAT CONTRACTOR PERSONNEL WILL BE REQUIRED TO STAY ONSITE UNTIL STORE OPENING.

## 10. CHANGE ORDERS

REFER TO THE GENERAL CONTRACT FOR TERMS AND CONDITIONS RELATING TO ALL CHANGE



11. WITHDRAWAL OF BID

BIDDER UNDERSTANDS THAT THIS BID MAY BE WITHDRAWN PRIOR TO SCHEDULED BID DATE OR POSTPONEMENT THEREOF.

12. SUBMISSION OF BID

THE OWNER WILL ACCEPT THE FULLY COMPLETED MS-EXCEL SPREADSHEET BID FORM AS FOLLOWS:

1) IN ELECTRONIC FILE FORMAT VIA E-MAIL. REFER TO SPECIFICATION SECTION 00110 PROJECT DATES ON WHERE AND WHEN TO E-MAIL BIDS

13. SUBMITTED BY: \_\_\_\_\_

FIRM NAME: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

SIGNED: \_\_\_\_\_

PRINT NAME: \_\_\_\_\_

TITLE: \_\_\_\_\_

DATE: \_\_\_\_\_

NOTE: EACH BID MUST BE FILLED OUT IN TRUE DUPLICATE (FOR COPIES TO BE DELIVERED AFTER E-MAIL). IF BIDDER IS A CORPORATION, INDICATE STATE OF CORPORATION; IF A PARTNERSHIP, LIST FULL NAMES OF ALL PARTNERS.

# Agreement Between Owner and Contractor – Stipulated Sum

HDSTIPSUM January 27 2014

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**AGREEMENT** made as of the       day of,       in the year       .

**BETWEEN** Owner:

*(Name and Address)*

**and** Contractor:

*(Name and Address)*

The Project is:

*(Name and Address)*

The Architect is:

*(Name and Address)*

Owner and Contractor agree as set forth below:

## **ARTICLE 1**

### **THE CONTRACT DOCUMENTS**

The Contract Documents consist of this Agreement, General Conditions of the Contract, the Exhibits to the Agreement, Drawings, Specifications, addenda issued prior to execution of this Agreement, other documents listed in this Agreement and Modifications issued after execution of this Agreement; these form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. An enumeration of the Contract Documents, other than Modifications, appears in Article 7.

## **ARTICLE 2**

### **THE WORK OF THIS CONTRACT**

Contractor shall execute the entire Work described in **Exhibit A**, Scope of Work, attached hereto, and in the Contract Documents, except to the extent specifically indicated in the Contract Documents to be the responsibility of others, or as follows:

## **ARTICLE 3**

### **DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION**

**3.1** The date of commencement is the date from which the Contract Time is measured, and shall be \_\_\_\_\_ unless the date is fixed in a notice to proceed issued by Owner. Prior to the commencement of the Work, and if required by the applicable Governmental Authority, Contractor shall file a "Notice of Commencement" or its equivalent with the applicable Governmental Authority for the Project to inform such Governmental Authority of the commencement of Contractor's Work at the Project.

**3.2** Contractor shall achieve Substantial Completion of the entire Work not later than: \_\_\_\_\_ ("Date of Substantial Completion"), subject to adjustments in the Contract Time as provided in the Contract Documents.

**3.3** To the extent that this Agreement pertains to the construction of a new Home Depot Store and is described as such in **Exhibit A**, the Grand Opening Date shall be: \_\_\_\_\_.

**3.4** The Contractor agrees that all work, services and other activities rendered in connection with the Project prior to the date of this Agreement, if any, are hereby deemed part of the Work under this Agreement and shall be governed hereby. The Contractor further represents and warrants to the Owner that (i) all such work, services and other activities rendered prior to the date of this Agreement were performed in accordance with the requirements of the Contract Documents, and (ii) that the Contractor is not aware of any claims that the Contractor may have in connection with the Project as of the date of this Agreement including, without limitation, any claim for an adjustment in compensation or the Contract Time and the Contractor hereby waives and forfeits all rights to any such claim.

## **ARTICLE 4**

### **CONTRACT SUM**

**4.1** Owner shall pay Contractor in current funds for the Contractor's performance of the Contract the fixed, stipulated Contract Sum of \_\_\_\_\_ Dollars (\$\_\_\_\_\_), subject to additions and deductions as provided in the Contract Documents.

**4.2** The Contract Sum is based upon the alternates, if any, provided in **Exhibit G**, attached hereto and incorporated herein and allowances, if any, provided in **Exhibit H**, attached hereto and incorporated herein.

**4.3** Unit prices, if any, are attached in **Exhibit B**. To the extent unit prices are included in **Exhibit B**, Contractor shall only be entitled to use such unit prices for the performance of Work subject to a Change Order. In addition, the unit prices, if any, attached as **Exhibit B** shall not increase at any time during the performance of the Work and shall be valid until final completion of the Work.

**4.4** In the case of additive or deductive Work authorized under Article 12 of the General Conditions, Contractor's markups shall be limited to **three** percent (3%) for profit and **three** percent (3%) for overhead, and Subcontractor's markups shall be limited to **five** percent (5%) for profit, and **five** percent (5%) for overhead. Profit and overhead amounts shall be calculated separately and then summed, so that neither amount is further marked up by the other.

## **ARTICLE 5**

### **PROGRESS PAYMENTS**

**5.1** Based upon Applications for Payment submitted to Owner by Contractor, Owner shall make progress payments on account of the Contract Sum to Contractor as provided below and in accordance with the General Conditions.

**5.2** The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

**5.3** Provided an Application for Payment is received by Owner and such Application for Payment conforms in all respects to the requirements set forth in the General Conditions, Owner shall make payment to Contractor as provided in the General Conditions.

**5.4** Each Application for Payment shall be based upon the Schedule of Values submitted by Contractor in accordance with the Contract Documents. The Schedule of Values shall allocate the entire Contract Sum among the various portions of the Work and be prepared in such form and supported by such data to substantiate its accuracy as Owner may require. This schedule, unless objected to by Owner, shall be used as a basis for reviewing the Contractor's Applications for Payment.

**5.5** Applications for Payment shall indicate the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

**5.6** Subject to the provisions of the Contract Documents, the amount of each progress payment shall be computed in accordance with the General Conditions.

**5.7** In addition to the requirements for payment outlined in the Agreement and General Conditions, Contractor shall follow and comply with Owner's standard billing procedures.

## **ARTICLE 6** **FINAL PAYMENT**

Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by Owner to Contractor when (1) the Contract has been fully performed by Contractor except for Contractor's responsibility to correct nonconforming Work as provided in Article 13 of the General Conditions and to satisfy other requirements, if any, which necessarily survive final payment; and (2) Contractor has satisfied all other conditions precedent as set forth in the General Conditions. To the extent required by Governmental Authority, final payment shall not be made until Contractor properly files and records a fully executed notice of completion, or its equivalent, with such Governmental Authority.

## **ARTICLE 7** **ENUMERATION OF CONTRACT DOCUMENTS**

**7.1** The Contract Documents, except for Modifications issued after execution of this Agreement, are enumerated as follows:

**7.1.1** The Agreement is this executed Agreement Between Owner and Contractor – Stipulated Sum.

**7.1.2** The General Conditions are the Home Depot U.S.A., Inc. General Conditions of the Contract, April 11 2012, Revision.

**7.1.3** The Specifications are those contained in the Project Manual dated \_\_\_\_\_, and are as follows:

**7.1.4** The Drawings are as follows, and are dated \_\_\_\_\_ unless a different date is shown below:

**7.1.5** The addenda, if any, are as follows:

Portions of addenda relating to bidding requirements are not part of the Contract Documents unless the bidding requirements are also enumerated in this Article 7.

**7.1.6** Other documents, if any, forming part of the Contract Documents are as follows and are attached hereto:

**Exhibit A – Scope of Work**

**Exhibit B – Unit Prices**

**Exhibit C – Construction Change Directive**

**Exhibit D – Schedule of Values**

**Exhibit E – Form Documentation (Payment Application, Mechanics Lien Waivers, Change Order)**

**Exhibit F – Project Schedule**

**Exhibit G – Alternates**

**Exhibit H – Allowances**

**Exhibit I -- Storm Water Penalties**

This Agreement is entered into as of the day and year first written above and is executed in at least three original copies of which one is to be delivered to Contractor, one to Architect, and the remainder to Owner.

**CONTRACTOR**

\_\_\_\_\_  
(Signature) (Date)

(Date)

\_\_\_\_\_  
(Print/Type Name)

\_\_\_\_\_  
(Print/Type Title)

**OWNER**

**HOME DEPOT U.S.A., INC.**

\_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Print/Type Name)

\_\_\_\_\_  
(Print/Type Title)

## **EXHIBIT A SCOPE OF WORK**

All drawings listed below are by **WD Partners** unless noted otherwise

**SET ISSUED FOR BID**

<b>DRAWING NUMBER</b>	<b>DRAWING TITLE</b>	<b>DRAWING DATE</b>	<b>REVISION NUMBER</b>	<b>REVISION DATE</b>
<b>GENERAL</b>				
T1.01	TITLE SHEET	04/02/18		
T1.02	LIFE SAFTEY PLAN			
<b>CIVIL (DRAWINGS BY: KIMLEY HORN)</b>				
C-000	COVER SHEET	04/02/18		
C-001	GENERAL NOTES	04/02/18		
C-002	EROSION CONTROL PLAN PHASE 1	04/02/18		
C-003	EROSION CONTROL PLAN PHASE 2	04/02/18		
C-004	EROSION CONTROL DETAILS	04/02/18		
C-005	EROSION CONTROL DETAILS	04/02/18		
C-100	SIGNING AND MARKING PLAN	04/02/18		
C-102	SITE DETAILS	04/02/18		
C-200	ACCESSIBILITY PLAN	04/02/18		
C-201	PAVING, GRADING AND DRAINAGE PLAN	04/02/18		
C-202	PAVING, GRADING AND DRAINAGE DETAILS	04/02/18		
C-203	PAVING, GRADING AND DRAINAGE DETAILS	04/02/18		
C-204	DRAINAGE STRUCTURE TABLES	04/02/18		
MDWASD	COVER SHEET	04/02/18		
C-300	UTILITY PLAN	04/02/18		
C-301	UTILITY PROFILES	04/02/18		
C-302	UTILITY PROFILES	04/02/18		
C-400	DEWATERING PLAN	04/02/18		
L-000	COVER SHEET	04/02/18		
L-100	OVERALL LANDSCAPE PLAN	04/02/18		
L-101	OVERALL PLANT SCHEDULE AND CODE TABLE	04/02/18		
L-200	LANDSCAPE PLAN	04/02/18		
L-201	LANDSCAPE PLAN	04/02/18		
L-202	LANDSCAPE PLAN	04/02/18		
L-203	LANDSCAPE PLAN	04/02/18		
L-250	LANDSCAPE SPECIFICATIONS	04/02/18		
L-251	LANDSCAPE DETAILS	04/02/18		
L-300	IRRIGATION PLAN	04/02/18		
L-301	IRRIGATION PLAN	04/02/18		
L-302	IRRIGATION PLAN	04/02/18		
L-303	IRRIGATION PLAN	04/02/18		
L-350	IRRIGATION NOTES	04/02/18		

DRAWING NUMBER	DRAWING TITLE	DRAWING DATE	REVISION NUMBER	REVISION DATE
L-351	IRRIGATION NOTES	04/02/18		
L-352	IRRIGATION DETAILS	04/02/18		
L-353	WELL NOTES AND DETAILS	04/02/18		
<b>STRUCTURAL</b>				
S0.01	GENERAL NOTES	04/02/18		
S1.11	FOUNDATION DETAILS	04/02/18		
S1.12	GARDEN CENTER FOUNDATION PLAN	04/02/18		
S1.21	ROOF FRAMING PLAN	04/02/18		
S2.21	WALL PANEL ELEVATIONS	04/02/18		
S2.22	WALL PANEL ELEVATIONS	04/02/18		
S2.23	WALL PANEL ELEVATIONS	04/02/18		
S4.11	ENLARGED FOUNDATION PLANS	04/02/18		
S4.12	ENLARGED FOUNDATION PLANS	04/02/18		
S4.21	ENLARGED FRAMING PLANS	04/02/18		
S5.11	FOUNDATION DETAILS	04/02/18		
S5.12	FOUNDATION DETAILS	04/02/18		
S5.13	FOUNDATION DETAILS	04/02/18		
S5.14	FOUNDATION DETAILS AT GARDEN CENTER	04/02/18		
S5.15	FOUNDATION DETAILS	04/02/18		
S5.21	FRAMING DETAILS	04/02/18		
S5.22	FRAMING DETAILS	04/02/18		
S5.23	FRAMING DETAILS	04/02/18		
S5.24	FRAMING DETAILS	04/02/18		
S5.25	FRAMING DETAILS	04/02/18		
S6.01	STRUCTURAL SCHEDULES	04/02/18		
<b>ARCHITECTURAL</b>				
F1	FIXTURE PLAN (FOR REFERENCE ONLY)	04/02/18		
A1.01	DIMENSIONED AND NOTED PLAN	04/02/18		
A1.02	ROOF PLAN	04/02/18		
A1.03	GARDEN CENTER PLANS	04/02/18		
A1.04	BOLLARD PLAN	04/02/18		
A2.01	EXTERIOR ELEVATIONS	04/02/18		
A2.02	EXTERIOR ELEVATIONS	04/02/18		
A3.01	EXTERIOR WALL SECTIONS	04/02/18		
A3.02	EXTERIOR WALL SECTIONS AT ENTRY AND EXIT	04/02/18		
A3.03	WALL SECTIONS AT LUMBER CANOPY	04/02/18		
A3.04	WALL SECTIONS AT GARDEN CENTER	04/02/18		
A3.05	EXTERIOR WALL SECTIONS	04/02/18		
A4.01	ENLARGED OFFICE PLANS	04/02/18		



DRAWING NUMBER	DRAWING TITLE	DRAWING DATE	REVISION NUMBER	REVISION DATE
A4.02	ENLARGED REFLECTED CEILING PLAN	04/02/18		
A4.03	OFFICE ELEVATIONS AND DETAILS	04/02/18		
A4.04	RESTROOM PLAN AND ELEVATIONS	04/02/18		
A4.05	LOUNGE AND TRAINING ROOM ELEVATIONS	04/02/18		
A4.06	TRC PLAN, ELEVATIONS AND DETAILS	04/02/18		
A4.07	ELECTRICAL ROOM PLAN AND DETAILS	04/02/18		
A4.08	LOADING DOCK PLAN AND DETAILS	04/02/18		
A4.11	APPLIANCE PLAN AND DETAILS	04/02/18		
A4.12	KITCHEN PLAN AND DETAILS	04/02/18		
A4.21	PNEUMATIC TUBE LAYOUT	04/02/18		
A5.01	WALL PARTITION SECTIONS	04/02/18		
A5.02	WALL PARTITION SECTIONS	04/02/18		
A5.03	WALL PARTITION SECTIONS	04/02/18		
A5.11	ROOF DETAILS	04/02/18		
A6.01	FINISH SCHEDULE - WINDOWS - BOLLARDS	04/02/18		
A6.02	DOOR SCHEDULE	04/02/18		
A6.03	DOOR DETAILS	04/02/18		
A6.04	GARDEN CENTER GATE DETAILS	04/02/18		
<b>GARDEN CENTER (DRAWINGS BY: ROUGH BROTHERS, INC.)</b>				
G1.0	GARDEN CENTER KEY PLAN	04/02/18		
G2.0	GARDEN CENTER COLUMN & FRAMING PLAN	04/02/18		
G2.1	GARDEN CENTER COLUMN & FRAMING PLAN	04/02/18		
G3.0	GARDEN CENTER ELEVATIONS	04/02/18		
G4.0	MISC. DETAILS	04/02/18		
G4.1	MISC. DETAILS	04/02/18		
G5.0	GARDEN CENTER RAIN SHIELD FRAMING PLAN	04/02/18		
G6.0	GARDEN CENTER SHADE DETAILS	04/02/18		
G7.0	GARDEN CENTER FRAMING ELEVATIONS	04/02/18		
G7.1	GARDEN CENTER FRAMING ELEVATIONS	04/02/18		
G7.2	GARDEN CENTER FRAMING ELEVATIONS	04/02/18		
G8.0	GARDEN CENTER INSULATIN DETAILS	04/02/18		
G8.1	GARDEN CENTER EXHAUST FAN DETAILS	04/02/18		
<b>PLUMBING</b>				
P1.01	PLUMBING PLAN	04/02/18		
P4.01	ENLARGED PLUMBING PLANS	04/02/18		
P4.02	TRC PLUMBING PLAN AND DETAILS	04/02/18		
P4.03	GARDEN CENTER IRRIGATION PLAN	04/02/18		
P5.01	PLUMBING DETAILS	04/02/18		

DRAWING NUMBER	DRAWING TITLE	DRAWING DATE	REVISION NUMBER	REVISION DATE
P5.02	GARDEN CENTER IRRIGATION DETAILS	04/02/18		
P6.01	PLUMBING SCHEDULES	04/02/18		
<b>MECHANICAL</b>				
M1.01	MECHANICAL PLAN	04/02/18		
M4.01	ENLARGED MECHANICAL PLANS	04/02/18		
M4.02	TRC MECHANICAL PLAN AND DETAILS	04/02/18		
M5.01	MECHANICAL DETAILS	04/02/18		
M6.01	MECHANICAL SCHEDULES	04/02/18		
<b>ELECTRICAL</b>				
E1.01	ELECTRICAL SITE PLAN	04/02/18		
E1.11	LIGHTING PLAN	04/02/18		
E1.12	DAYLIGHT CONTROL ZONES	04/02/18		
E1.21	POWER PLAN	04/02/18		
E1.22	GARDEN CENTER LIGHTING AND POWER PLANS	04/02/18		
E1.31	ENERGY MANAGEMENT PLAN	04/02/18		
E4.11	ENLARGED LIGHTING PLANS	04/02/18		
E4.21	ENLARGED PAOWER AND DATA PLANS	04/02/18		
E4.22	ENLARGED PAOWER AND DATA PLANS	04/02/18		
E4.23	DATA AND VAULT ROOM PLAN AND DETAILS	04/02/18		
E4.24	DOCK POWER PLAN AND DETAILS	04/02/18		
E4.26	TRC ELECTRICAL	04/02/18		
E4.31	ENLARGED DESK DETAILS	04/02/18		
E4.32	ENLARGED DESK DETAILS	04/02/18		
E4.33	ENLARGED DESK DETAILS	04/02/18		
E4.34	ENLARGED DESK DETAILS	04/02/18		
E4.41	KITCHEN ELECTRICAL PLAN AND DETAILS	04/02/18		
E4.42	FAN AND LIGHT DISPLAY PLAN AND DETAILS	04/02/18		
E5.11	LIGHTING DETAILS	04/02/18		
E5.21	POWER DETAILS	04/02/18		
E5.31	ENERGY MANAGEMENT DETAILS	04/02/18		
E5.41	IN-RACK DETAILS	04/02/18		
E5.42	IN-RACK SCHEDULE	04/02/18		
E5.43	IN-RACK LIGHTING PLAN	04/02/18		
E5.44	IN-RACK POWER PLAN	04/02/18		
E6.01	ELECTRICAL SCHEDULES	04/02/18		
E6.02	ONE-LINE DIAGRAM	04/02/18		
E6.03	PANELBOARD SCHEDULES FRONT	04/02/18		
E6.04	PANELBOARD SCHEDULES REAR	04/02/18		
E6.05	CONTACTOR SCHEDULE	04/02/18		

DRAWING NUMBER	DRAWING TITLE	DRAWING DATE	REVISION NUMBER	REVISION DATE
E6.06	GENERATOR DETAILS	04/02/18		
E6.07	GENERATOR DETAILS	04/02/18		
E6.08	GENERATOR DETAILS	04/02/18		
<b>FIRE ALARM (DRAWINGS BY: TELGIAN)</b>				
CS1.0	COVER SHEET	04/02/18		
OV1.0	OVERALL FIRE ALARM INITIATING DEVICE LAYOUT	04/02/18		
FA1.1	FIRE ALARM INITIATING DEVICE LAYOUT	04/02/18		
FA1.2	FIRE ALARM INITIATING DEVICE LAYOUT	04/02/18		
FA1.3	FIRE ALARM INITIATING DEVICE LAYOUT	04/02/18		
FA1.4	FIRE ALARM INITIATING DEVICE LAYOUT	04/02/18		
FA1.5	FIRE ALARM INITIATING DEVICE LAYOUT	04/02/18		
FA1.6	FIRE ALARM INITIATING DEVICE LAYOUT	04/02/18		
FA1.7	FIRE ALARM INITIATING DEVICE LAYOUT	04/02/18		
OV2.0	OVERALL FIRE ALARM NOTIFICATION DEVICE LAYOUT	04/02/18		
FA2.0	FIRE ALARM NOTIFICATION DEVICE LAYOUT	04/02/18		
FA2.1	FIRE ALARM NOTIFICATION DEVICE LAYOUT	04/02/18		
FA2.2	FIRE ALARM NOTIFICATION DEVICE LAYOUT	04/02/18		
FA2.3	FIRE ALARM NOTIFICATION DEVICE LAYOUT	04/02/18		
FA2.4	FIRE ALARM NOTIFICATION DEVICE LAYOUT	04/02/18		
FA2.5	FIRE ALARM NOTIFICATION DEVICE LAYOUT	04/02/18		
FA2.6	FIRE ALARM NOTIFICATION DEVICE LAYOUT	04/02/18		
FA2.7	FIRE ALARM NOTIFICATION DEVICE LAYOUT	04/02/18		
FA3.0	FIRE ALARM INITIATING RISER DIAGRAM	04/02/18		
FA4.0	FIRE ALARM NOTIFICATION DEVICE RISER DIAGRAM	04/02/18		
FA5.0	FIRE ALARM CALCULATIONS AND NOTES	04/02/18		
FA6.0	FIRE ALARM DETAILS	04/02/18		
FA7.0	BUILDING CROSS SECTIONS	04/02/18		
<b>SECURITY ALARM (DRAWINGS BY: TELGIAN)</b>				
BA1.0	INTRUSION ALARM DEVICE LAYOUT	04/02/18		
BA2.0	INTRUSION ALARM RISER	04/02/18		
BA3.0	INTRUSION ALARM DETAILS	04/02/18		
BA4.0	INTRUSION ALARM DETAILS	04/02/18		
<b>FIRE SPRINKLER (DRAWINGS BY: TELGIAN)</b>				
FP1.0	SITE FIRE SERVICE PIPING PLAN	04/02/18		
FP 2.0	FIRE SPRINKLER PIPING PLAN SYSTEM #1	04/02/18		
FP 3.0	FIRE SPRINKLER PIPING PLAN SYSTEM #2 AND #3	04/02/18		
FP 4.0	FIRE SPRINKLER PIPING PLAN SYSTEM #3	04/02/18		
FP 5.0	FIRE SPRINKLER PIPING PLANS – RACK PLANS AND DETAILS	04/02/18		
FP 6.0	FIRE SPRINKLER PIPING CANOPIES / HANGER DETAILS	04/02/18		

DRAWING NUMBER	DRAWING TITLE	DRAWING DATE	REVISION NUMBER	REVISION DATE
FP 7.0	FIRE SPRINKLER PUMP ROOM / DETAILS	04/02/18		

#### SPECIFICATIONS

SECTION	SECTION TITLE	DATE	REVISION NUMBER	REVISION DATE
00000	Cover	04/02/18		
00001	Contract Date Clarification	12/23/05		
00010	Table of Contents	04/02/18		
00015	Project Directory	04/02/18		
00100	Invitation to Bid	04/02/18		
00110	Project Dates (Hard Copy)	04/02/18		
00200	Instructions to Bidders	04/02/18		
00400	Bid Proposal Form	04/02/18		
00500	Stipulated Sum Contract (HDSTIPSUM 01 27 14)	01/27/14		
00700	General Conditions (HDGENCON 04-11-2012)	04/11/12		
00900	Soils Report	12/23/05		
00900-A	Final Geotech Report	11/20/17		
00900-B	Addendum to Final Geotech Report	11/27/17		
01000	Special Conditions	09/21/11		
01001	Special Conditions: Letter to Contractor	04/02/18		
01010	Furnished by Owner Items (FBO)	09/04/09		
01010	FBO Form A: Contractor Information Form	06/22/05		
01010	FBO Form B: Take-Off Confirmation Sheet	06/22/05		
01010	FBO Form C: Confirmation Of Shipment	06/22/05		
01010	FBO Form D: Request For Additional/Replacement FBO Materials	06/22/05		
01010	FBO Form E: Returned Materials	06/22/05		
01011	Special Purchase Program (SPP)	01/22/07		
01012	Preferred Purchasing	02/09/12		
01200	Project Meetings	02/09/07		
01200	Project Meetings - Form A	09/17/03		
01200	Project Meetings - Form B	09/17/03		
01230	Alternates	03/16/09		
01300	Submittals	02/28/14		
01411	Testing and Inspection	04/16/14		
01425	Roofing Testing and Inspection Service	09/01/01		
01430	Surveying	09/01/01		
01500	Temporary Construction Facilities	09/21/11		
01630	Substitutions and Product Options	09/01/01		
01700	Project Closeout	06/11/09		

SECTION	SECTION TITLE	DATE	REVISION NUMBER	REVISION DATE
01730	Operations & Maintenance Data	09/01/01		
01800	Abbreviations & Definitions	03/11/05		
02000	Site Work – Division of Responsibility	04/02/18		
02200	Earthwork	04/02/18		
02260	Modular Retaining Wall System	04/02/18		
02282	Termite Control	04/02/18		
02370	Erosion and Sedimentation Control	04/02/18		
02513	Asphalt Concrete Paving	04/02/18		
02520	Portland Cement Concrete Paving	04/02/18		
02550	Site Utilities	04/02/18		
02580	Pavement Markings	04/02/18		
02721	Storm Drainage System	04/02/18		
02810	Fine Grading, Temporary Grassing and Erosion Control	04/02/18		
02920	Soil Preparation	04/02/18		
02930	Lawn and Sod	04/02/18		
02940	Landscape Planting	04/02/18		
02950	Trees, Shrubs, Vines and Groundcover	04/02/18		
02960	Landscape Irrigation	04/02/18		
03131	Permanent Plastic Concrete Forming	10/10/17		
03150	(FBO) Slab on Ground Accessories (PNA)	10/10/17		
03300	Cast-in-Place Concrete	10/10/17		
03300	Concrete Mix Design Submittal Form	10/10/17		
03300	Pre-Concrete Construction Conference Agenda	10/10/17		
03360	Special Concrete Floor Finishes	10/10/17		
03390	Slab on Ground	10/10/17		
03470	Tilt-Up Panels	10/11/17		
03600	Non-Shrink Grout	10/11/17		
04100	Mortar and Grout	10/11/17		
04200	Brick Masonry	10/11/17		
04230	Reinforced Unit Masonry	10/11/17		
05120	Structural Steel	10/11/17		
05210	(FBO) Steel Joist Girders (Vulcraft)	10/11/17		
05220	(FBO) Steel Joists (Vulcraft)	10/11/17		
05300	(FBO) Steel Deck (Vulcraft)	10/12/17		
05400	Cold Formed Metal Framing	10/11/17		
05501	Metal Fabrications	10/11/17		
05580	Sheet Metal Fabrications	10/11/17		
06100	Rough Carpentry	10/11/17		
06402	Interior Architectural Woodwork	10/11/17		

SECTION	SECTION TITLE	DATE	REVISION NUMBER	REVISION DATE
07180	Water Repellent	10/11/17		
07201	Building Insulation	10/11/17		
07240	Exterior Insulation and Finish System	10/11/17		
07406	Metal Roof and Wall Panels	10/11/17		
07534	(FBO) Single Ply TPO Membrane Roofing	10/12/17		
07600	Flashing and Sheet Metal	10/12/17		
07620	(FBO) TPO Flashing and Sheet Metal	10/12/17		
07701	(FBO) Roof Hatch	10/12/17		
07720	(FBO) Manufactured Structural Roof Curbs	10/12/17		
07840	Firestopping	10/12/17		
07901	Joint Sealers/Fillers	10/12/17		
08110	(FBO) Hollow Metal Doors and Frames (DH Pace)	10/12/17		
08331	(FBO) Overhead Coiling Doors (Cornell)	10/12/17		
08412	Aluminum Entrances and Storefront	10/12/17		
08425	(FBO) Automatic Sliding Doors (Stanley)	10/12/17		
08460	(FBO) Contractor Doors (Stanley)	10/12/17		
08620	Skylights	10/12/17		
08625	Heat and Smoke Vents	10/12/17		
08700	(FBO) Finish Hardware (DH Pace)	10/12/17		
08800	Glass and Glazing	10/12/17		
09220	Portland Cement Plaster (Stucco)	10/12/17		
09260	Gypsum Drywall	10/12/17		
09300	Tile	03/08/18		
09510	Acoustical Ceilings	10/12/17		
09549	Exterior Linear Meat Soffit System	10/12/17		
09653	Vinyl Base	10/12/17		
09659	Tactile Warning Surfacing	10/12/17		
09790	Floor Striping	10/12/17		
09860	Graffiti Resistant Coating	10/12/17		
09900	(FBO) Painting (Behr)	10/12/17		
09900-A	Paint Take-Off Order Sheet	10/12/17		
09985	Fiberglass Reinforced Panels	10/12/17		
10166	(SPP) Toilet Partitions	10/12/17		
10350	Flagpoles	10/12/17		
10606	Chain Link Fencing and Gates	10/12/17		
10810	(SPP) Toilet Accessories	10/12/17		
11020	(FBO) Safes (SDS)	10/12/17		
11160	Loading Dock Equipment	10/12/17		
13070	Bullet Resistant Protection	10/11/17		

SECTION	SECTION TITLE	DATE	REVISION NUMBER	REVISION DATE
13125	(NIC) Portable and Movable Buildings	10/13/17		
13128	(FBO) Garden Center Fabrications	10/12/17		
13700	(FBO) Closed Circuit Television (CCTV) (Tyco)	02/28/14		
13727	(FBO) Security Alarm System (Tyco)	02/28/14		
13900	Fire Protection and Fire Pump	10/11/10		
13905	(NIC) Fire Extinguishers	01/11/13		
14580	(FBO) Pneumatic Tube System (Aerocom)	10/12/17		
15010	Mechanical General Requirements	10/13/17		
15050	Basic Material and Methods	04/23/02		
15140	Supports and Anchors	09/11/07		
15250	HVAC Insulation	09/11/07		
15400	Plumbing	09/11/07		
15410	(SPP) Plumbing Fixtures	10/28/11		
15430	Above Ground Irrigation System	01/11/13		
15450	Rainwater Harvesting System	10/26/17		
15610	(FBO) Unit Heater (Lennox)	05/30/14		
15625	(FBO) Low Intensity Radiant Heaters (Lennox-Reznor)	11/07/13		
15730	(FBO) Rooftop Units (Lennox)	08/13/14		
15850	(FBO) Fans (Lennox-Greenheck)	11/07/13		
15880	Air Distribution	09/11/07		
15952	(FBO) Controls (Novar)	10/11/17		
15960	(FBO) Energy Management Controls and Commissioning	10/11/17		
15990	Test, Adjust, and Balance	01/15/10		
16010	General Provisions	09/01/01		
16015	Definitions	09/01/01		
16020	Work Included	09/01/01		
16025	Work Not Included	09/01/01		
16030	Tests	09/01/01		
16040	Identification	01/15/10		
16100	Basic Materials and Methods	06/20/03		
16101	Substitution Request Form	09/01/01		
16110	Raceways	10/19/09		
16111	(FBO) Track Busway	04/24/09		
16120	Wire and Cables	10/19/09		
16121	(FBO) Flexible Wiring System (Lithonia)	10/16/14		
16125	Low-Voltage Wiring	01/29/10		
16130	Outlet Boxes and Junction Boxes	10/19/09		
16140	Switches and Receptacles	04/01/14		
16150	Motors	09/01/01		

SECTION	SECTION TITLE	DATE	REVISION NUMBER	REVISION DATE
16235	(FBO) UPS System (APC)	07/16/10		
16289	TVSS System	07/16/10		
16400	(FBO) Service and Distribution (CPI)	01/15/10		
16410	Electrical Service	06/23/04		
16415	Primary Service	09/11/07		
16450	Grounding	09/11/07		
16500	(FBO) Lighting (Lithonia)	10/16/14		
16620	(FBO) Emergency Electrical Generating System (Nixon-Kohler)	08/19/11		
16625	(FBO) Automatic Load Transfer (Nixon-Kohler)	08/19/11		
16700	Communication System (Telephone)	07/16/10		
16710	(FBO) Information Transport System	07/16/10		
16715	(FBO) Television Equipment	02/14/08		
16720	(FBO) Fire Alarm System	02/20/18		
16727	(FBO) Security System	02/20/18		
16856	Electric Heating Cables	09/11/07		



**EXHIBIT B**  
**UNIT PRICES**

To Bid or accept unit pricing is a collaborative decision between the PM, CM and Director. If unit pricing is used it must be used for the duration of the project for change orders.

**UNIT PRICES:**

SHOULD ADDITIONAL WORK BE REQUIRED, OR SHOULD QUANTITIES OF CERTAIN CLASSES OF WORK BE INCREASED OR DECREASED FROM THE BASE CONTRACT, BY APPROVAL OF THE OWNER, THE CONTRACTOR AGREES THAT THE FOLLOWING UNIT PRICES MAY BE USED AS THE BASIS OF PAYMENT TO CONTRACTOR OR CREDIT TO THE OWNER FOR SUCH ADDITIONS, INCREASE OR DECREASE IN THE WORK AS DETERMINED BY THE OWNER.

UNIT PRICES SHALL COVER ALL LABOR, MATERIAL, AND RELATED FEES TO PERFORM THE REQUIRED WORK ITEMS. NO ADDITIONAL ADJUSTMENT WILL BE ALLOWED FOR OVERHEAD, PROFIT, INSURANCE, OR OTHER DIRECT OR INDIRECT EXPENSE OF THE SUBCONTRACTOR.

**UNIT PRICING – BUILDING**

Concrete Slab On-Grade

6" w/Woven Wire Fabric	\$ _____	/S.F.
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6" w/Synthetic Fiber Reinforcement	\$ _____	/S.F.
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Concrete Floor Sealer	\$ _____	/S.F.
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Polished, Sealed and Hardened Floor Finish	\$ _____	/S.F.
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6" Pipe Bollards	\$ _____	/EA
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4" Pipe Bollards	\$ _____	/EA
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T5 Fixtures Sales Area

Installed	\$ _____	/EA
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Relocated	\$ _____	/EA
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Garden Center Light Fixtures	\$ _____	/EA
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Sprinkler Head In-Rack	\$ _____	/EA
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Duplex or Quad Receptacle In-Rack (Reloc connect)

Installed	\$ _____	/EA
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Relocated	\$ _____	/EA
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In-Rack Light Fixture (Reloc connect)

Installed	\$ _____	/EA
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Relocated	\$ _____	/EA
-----------	----------	-----

Plug mold In-Rack (Reloc connect)

Installed	\$ _____	/EA
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Relocated	\$ _____	/EA
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Power/Lighting In-Rack Track (Reloc connect)

Installed	\$	/EA
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Relocated	\$	/EA
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Electrical Hard Piping

120V Duplex Receptacle (Branch Circuit)	\$	/EA
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120V Duplex Receptacle (Dedicated Circuit)	\$	/EA
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120V Quad Receptacle (Branch Circuit)	\$	/EA
---------------------------------------	----	-----

Light Fixtures (excluding "FRL" fixtures)	\$	/EA
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Hourly Rates:

Electrician	\$	/HR
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Carpenter	\$	/HR
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Painter	\$	/HR
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HVAC	\$	/HR
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Plumber	\$	/HR
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Sprinkler Pipe Fitter	\$	/HR
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Mason	\$	/HR
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**EXHIBIT C**  
**CONSTRUCTION WORK DIRECTIVE**  
**(This is not a Change Order)**

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Project:  
(name, address)

DIRECTIVE NO:

DATE:

TO CONTRACTOR:  
(name, address)

CONTRACT DATE:

This directive is being issued in order to expedite the work to be performed on the Project, minimize delays or other impacts to the Project, and to memorialize Owner's directive to Contractor. This is not a Change Order and no inference regarding the validity of any future Change Order request for the scope of work listed below shall be made. When signed by Owner and received by the Contractor, this document becomes effective IMMEDIATELY and the Contractor shall proceed as directed, regardless of whether there is or is not a proposed basis of adjustment to the Contract Sum or Contract Time stated below. To the extent that Contractor believes the work covered by this directive involves an adjustment to the Work, Contract Sum or Contract Time, Contractor shall prepare and submit a written request for a Change Order in accordance with the Contract Documents. Contractor is hereby directed to proceed with the performance of the work described below:

**PROPOSED ADJUSTMENTS**

1. The proposed basis of adjustment to the Contract Sum is as follows, subject to Paragraph 12.1.3 of the General Conditions (with notation of applicable Subparagraph):
  - ☐ Lump Sum (increase) (decrease) of \$\_\_\_\_\_ (12.1.3(1)).
  - ☐ Unit Price of \$\_\_\_\_\_ per the Contract Documents (12.1.3(2))
  - ☐ Cost of the Work as follows: \_\_\_\_\_ (12.1.3(3))
  - ☐ RFP \_\_\_\_\_(refer to approved RFP as processed through Expedite) (12.1.3(4))
  - ☐ Cost of the Work unknown at this time (12.1.3(5))
  - ☐ No change in cost anticipated
  
2. The Contract Time is proposed to (be adjusted) (remain unchanged). The proposed adjustment, if any, is (an increase of \_\_\_\_\_ days) (a decrease of \_\_\_\_\_ days).
  
3. The amounts listed above, if any, are for estimation purposes only (unless an approved RFP is

referenced in item 1 above). All changes to the Contract Sum and Contract Time, if any, shall not be deemed final unless the parties execute a Change Order.

\_\_\_\_\_

OWNER

BY \_\_\_\_\_

DATE \_\_\_\_\_

**EXHIBIT D**  
**SCHEDULE OF VALUES**

**EXHIBIT E**  
**FORM DOCUMENTATION**  
**(PAYMENT APPLICATION, MECHANICS LIEN WAIVERS, CHANGE ORDER)**

**CHANGE ORDER**

**Home Depot U.S.A., Inc.**

**CHANGE ORDER FORM FOR  
AGREEMENT BETWEEN  
OWNER AND CONTRACTOR  
FOR A STIPULATED SUM  
(LONG FORM)**

Project:

Change Order Number:

Date:

To Contractor:

Architect's Project Number:

Contract Date:

Contract For:

Description of Work/Work Directive(s) included:

Contractor waives any and all rights to claim additional time or money under the Agreement for the Work to be performed pursuant to this Change Order, including without limitation, all claims, costs or damages for delay, disruption, hindrance, interference, extended or extraordinary direct and indirect overhead, multiplicity of changes, loss of productivity, labor or material cost escalations, inefficiency, legal expenses, consultant fees, interest, lost profits or revenue, bond or insurance costs, currency fluctuations, changes in taxes or other related claims, costs or damages. This Change Order constitutes compensation in full to the Contractor for all costs and markups directly or indirectly attributable to the changes ordered herein, for all delays related thereto, and for performance of the changes within the time stated below.

Unless Unit Prices have been agreed to and indicated below, this Change Order is approved upon execution pursuant to Article 12.1.3(4) of the Home Depot General Conditions of the Contract for Construction.

☐ This Change Order is approved upon execution pursuant to Article 12.1.3(2) of the General Conditions of the Contract for Construction and the Unit Prices(s) is/are the price(s) agreed to in the Contract Documents or those Unit Prices attached hereto. All Change Orders are subject to Owner's rights of audit and reimbursement as specified in Articles 7.6.3 and 9.8.6 of the General Conditions of the Contract for Construction. This Change Order together with the Contract Documents, represent the complete and entire agreement between the parties with respect to the Work covered by this Change Order.

**NOT VALID UNTIL CONTRACTOR RECEIVES OWNER'S APPROVAL IN EXPESITE**

The original Contract Sum was:

\$ \_\_\_\_\_

Net changed by previously authorized Change Orders:

\$ \_\_\_\_\_

The adjusted Contract Sum prior to this Change Order was:

\$ \_\_\_\_\_

The Contract Sum will be (increased) (decreased) (unchanged)  
by this Change Order in the estimated amount of:

\$ \_\_\_\_\_

*(For projects administered through Expesite, any approved change in the Contract Sum will be reflected in the contract summary tab in Expesite and not on this Change Order.)*

For projects not administered through Expesite, the adjusted Contract  
Sum Including this Change Order is:

\$ \_\_\_\_\_

The original Contract Time was \_\_\_\_\_ days.  
Net Change in Time from Previous Approved Change Orders was \_\_\_\_\_ days.  
The Contract Time will be (increased) (decreased) (unchanged) by (     ) days.  
The Original Date of Substantial Completion was: \_\_\_\_\_.  
The Date of Substantial Completion prior to this Change was: \_\_\_\_\_.  
The current estimated date of Substantial Completion as of the date of this Change Order therefore  
is \_\_\_\_\_.

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Contractor: \_\_\_\_\_

Address: \_\_\_\_\_

By: \_\_\_\_\_

Date: \_\_\_\_\_



**EXHIBIT E**  
**WAIVER OF LIEN TO DATE**

STATE OF \_\_\_\_\_(7) )  
 )  
COUNTY OF \_\_\_\_\_(1) )

TO WHOM IT MAY CONCERN:

WHEREAS the undersigned pursuant to a contract with (2) \_\_\_\_\_  
to furnish (3) \_\_\_\_\_  
for the premises commonly known as (4) \_\_\_\_\_,  
located in (5) \_\_\_\_\_, of which Home Depot U.S.A., Inc. is the owner.

The undersigned, for and in consideration of \$ (6) \_\_\_\_\_, do(es) hereby  
waive and release any and all lien or claim of, or right to, lien, under the statutes of the State of  
(7) \_\_\_\_\_, or otherwise, with respect to and on said above-described premises, and the improvements  
thereon, and on the material, fixtures, apparatus or machinery furnished, and on the moneys, funds or other  
considerations due or to become due from the owner, on account of labor, services, work, material, fixtures,  
apparatus or machinery, furnished to this date by the undersigned for the above-described premises, including  
change orders. By executing this lien waiver and release, undersigned agrees to indemnify, defend, protect, and  
hold harmless owner and its constituent entities from and against any and all lien claims, including, without  
limitation, interest and reasonable attorneys' fees and arbitration and/or litigation costs, arising out of or resulting  
from any labor, services, work, material, fixtures, apparatus or mechanics furnished to this date.

Date: (8) \_\_\_\_\_ Company Name: \_\_\_\_\_  
Address: \_\_\_\_\_

SIGNATURE AND TITLE: \_\_\_\_\_

NOTE: If waiver is for a corporation, corporate name should be used, corporate seal affixed and title of officer  
signing waiver should be set forth; if waiver is for a partnership, the partnership name should be used, partner should  
sign and designate himself as partner.

**CONTRACTOR'S AFFIDAVIT**

STATE OF \_\_\_\_\_(7) )  
 )  
COUNTY OF \_\_\_\_\_(1) )

TO WHOM IT MAY CONCERN:

The undersigned, (name of individual executing waiver) \_\_\_\_\_ being duly  
sworn, deposes and says that he or she is (Position) \_\_\_\_\_ of (Company Name)  
\_\_\_\_\_ who is the contractor furnishing  
(3) \_\_\_\_\_ work on the project located at  
(5) \_\_\_\_\_ owned by  
(9) \_\_\_\_\_. That the total amount of the contract including  
change orders is \$(10) \_\_\_\_\_ on which payment of  
\$(11) \_\_\_\_\_ has been received prior to this payment. That all waivers are true, correct and genuine  
and delivered unconditionally and that there is no claim either legal or equitable to defeat the validity of said  
waivers. That the following are the name of all parties who have furnished material or labor, or both, for said work  
and all parties have contracts or subcontracts for specific portions of said work or for material entering into the

construction thereof and the amount due or to become due to each, and that the items mentioned include all labor and material required to complete said work according to drawings and specifications:

Names of Contractors Performing Work Subject to this Waiver	What For	Contract Price Including Change Orders	Amount Paid	This Payment	Balance Due
TOTAL		(10)	(11)	(6)	(12)

That there are no other contracts for said work outstanding, and there is nothing due or to become due to any person for material, labor or other work of any kind done or to be done upon or in connection with said work other than the above stated.

DATE \_\_\_\_\_ SIGNATURE \_\_\_\_\_  
TITLE: \_\_\_\_\_

SUBSCRIBED AND SWORN TO BEFORE ME THIS \_\_\_\_ DAY OF \_\_\_\_\_, \_\_\_\_.

\_\_\_\_\_  
Notary

- (1) Insert name of County where waiver is executed;
- (2) Insert name of party who hired you;
- (3) Describe the Work furnished by this Contractor
- (4) Insert common name of Project;
- (5) Insert legal address of Project;
- (6) Insert Amount of this Payment;
- (7) Insert name of State where waiver is executed;
- (8) Insert Effective Date of waiver;
- (9) Insert Owner of Project;
- (10) Insert Contract Amount Including Extras;
- (11) Insert Amount of Prior Payments;
- (12) Insert amount remaining on Contract.

**EXHIBIT E**  
**FINAL WAIVER OF LIEN**

STATE OF \_\_\_\_\_ )  
 ) SS  
COUNTY OF (1) \_\_\_\_\_ )

TO WHOM IT MAY CONCERN:

WHEREAS the undersigned has been employed by (2) \_\_\_\_\_ to furnish  
(3) \_\_\_\_\_ for the premises known as (9) \_\_\_\_\_,  
located at (4) \_\_\_\_\_.

The undersigned, for and in consideration of (5) \$ \_\_\_\_\_, and other good and valuable consideration, the receipt whereof is hereby acknowledged, does hereby waive and release any and all lien or claim of, or right to, lien, under the statutes of the State of \_\_\_\_\_, relating to liens of mechanics, laborers and materialmen with respect to and upon the foregoing described property, and the improvements thereon, and with respect to any statutory lien bond, and on the material, fixtures, apparatus or machinery furnished, and on the moneys, funds or other considerations due or to become due from the Owner, on account of labor, services, material, fixtures, apparatus or machinery heretofore furnished, or which may be furnished at any time hereafter, by the undersigned for the foregoing described property. By executing this lien waiver and release, undersigned agrees to indemnify, defend, protect, and hold harmless owner and its constituent entities from and against any and all lien claims, including, without limitation, interest and reasonable attorneys' fees and litigation costs, arising out of or resulting from any labor, services, work, material, fixtures, apparatus or mechanics furnished for the above-described premises.

\_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_

Signature: \_\_\_\_\_  
Title: \_\_\_\_\_

**CONTRACTOR'S AFFIDAVIT**

STATE OF \_\_\_\_\_ )  
 ) SS  
COUNTY OF (1) \_\_\_\_\_ )

TO WHOM IT MAY CONCERN:

The undersigned, being duly sworn, deposes and says that he has been employed by (2) \_\_\_\_\_, the Contractor (or Owner), for the premises known as (9) \_\_\_\_\_, located at (4) \_\_\_\_\_. That the total amount of the contract including extras is (6) \$ \_\_\_\_\_, on which he has received payment of (7) \$ \_\_\_\_\_ for payment applications (12) \_\_\_\_\_ to \_\_\_\_\_ prior to this payment. That

all waivers are true, correct and genuine and delivered unconditionally and that there is no claim either legal or equitable to defeat the validity of said waivers. That the following are the names of all parties who have furnished material or labor, or both, for said work and all parties having contracts or subcontracts for specific portions of said work or for material entering into the construction thereof and the amount due or to become due to each and that the items mentioned include all labor and material required to complete said work according to plans and specifications:

NAMES (include undersigned's portion of contract) Attach additional pages if necessary	WHAT FOR	CONTRACT AMOUNT	PRIOR PAYMENTS	THIS PAYMENT	BALANCE DUE
(Undersigned MUST complete this line) TOTALS		(6)	(7)	(5)	(8)

That there are no other contracts for said work outstanding, and that there is nothing due or to become due to any person for material, labor or other work of any kind done or to be done upon or in connection with said work other than above stated.

Signed this \_\_\_\_ day of \_\_\_\_\_ 20\_\_

SIGNATURE \_\_\_\_\_  
TITLE: \_\_\_\_\_

Subscribed and sworn to before me this \_\_\_\_ day of \_\_\_\_\_ 20\_\_

\_\_\_\_\_  
Notary

- (1) Insert name of County where waiver is executed;
- (2) Insert name of party who hired you;
- (3) Describe what was furnished, e.g. carpentry, plumbing, etc.;
- (4) Location of project by legal description and/or common address if known;
- (5) Insert amount of this payment;
- (6) Insert contract amount including extras;
- (7) Insert amount of prior payments;
- (8) Insert \$0;
- (9) Insert commonly known name of project;
- (10) Intentionally Omitted;
- (11) Insert effective date of waiver;
- (12) Insert prior payment applications numbers that have been paid.

## **EXHIBIT F PROJECT SCHEDULE**

### **BENCHMARK SCHEDULE**

(Non-Holiday Schedule)

#### **PART 1 T-X SCHEDULE**

##### **Home Depot Completion Milestones**

The standard for Home Depot construction is to achieve Substantial Completion by Turnover (T). However, for scheduling purposes, the General Contractor is advised of the following internal construction/installation events that must occur prior to Turnover. In order for these activities to occur, the General Contractor is expected to have completed the concurrently listed Completion Milestones. (The dates listed below are noted as T-x where x indicates the number of weeks prior to Turnover. **All events and completion milestones are assumed to occur at the beginning of the week.**) This list of scheduled events is the minimum expected completion level; it is not to be considered a comprehensive listing and is subject to modification by the HD Project Manager. The contractor(s) is expected to review these milestones in the weekly job progress meetings and to immediately notify the HD PM if there is any reason that these milestones cannot be achieved. This schedule is based on a prototypical event. If the project building schedule is more/less than the T-18 (Building Start) the contractor must adjust those items affected such that in no event will adjustments be allowed that impact T-6 to Turnover and Grand Opening. Those items from T-6 to Turnover are expected completion requirements as a minimum.

**During the week(s) prior to Week T-6, the HD PM will schedule a mandatory coordination meeting with Telecommunications Provider, the Fixture/Display Contractor, the Home Depot PM, and representatives of Home Depot Store Planning and the Home Depot IS Department. The Electrical Subcontractor's Foreman and/or PM will also be in attendance. The Store Manager will be invited to attend.**

- T-?      Site Work & Building Pad Prep. (Project Start).  
            NOI Posted and copy of GC NOI sent to PM.
  
- T-18      Building Pad Complete  
            Begin Building Construction.
  
- T-17      Foundations  
            Rough Electric  
            Rough Plumbing Start.
  
- T-15      Start Slab  
            Coordinate with Sensormatic.
  
- T-14      Start Forming Tilt Walls (if applicable).
  
- T-12      Tilt or Precast Walls Erected.
  
- T-10      Steel & Deck Complete.  
            Get Current Fixture Plan From PM.
  
- T-9        Roof On.  
            Electrical, Mechanical, Plumbing & Fire Sprinklers Started.  
            Fire and Burglar alarm conduit started by Electrical Contractor.
  
- T-8        **Utility Service to Building Complete: Permanent Power, Phone, Water, Sanitary, Gas (as applicable) and Storm Sewer**
  
- T-7        Start Painting Ceilings & Sales Floor.  
            Get Final In-Rack Fire Plan From Consultant.  
            Electrical Contractor to install Phone and Data Conduit for ITS Contractor.  
            **Permanent Power Connected**
  
- T-6        Fire and Burglar alarm conduit, components and control panel power completed by Electrical Contractor.  
            Painting Complete Under Sales Floor Deck.  
            Vault and Managers Office Must Be Lockable for Data/Phone Equipment.  
            ITS Contractor begins overhead and office package installation (Phase 1).  
            Data Room construction is complete.  
            On-Site Phone/Data Meeting.

- T-5 Seal Floor, Sales Floor Lighting Operational.  
Floors must be SPOTLESS by end of this week.  
Fire and Burglar alarm systems completed.  
Hiring Trailer arrives for setup.  
Baler & Compactor Arrives and installed/operational.  
Site Paving Must Be Complete and Truck Dock Operational.
- T-4 **Display Contractor and Rack Contractor Arrives** & Installs Millwork in Back Office, Sets Check-out Stands (Front-end, Tool Corral), Sets Special Service Desk, Phone Sales Center & Contractor's Desk, Starts Kitchen/Bath Walls.  
Rack Erection Begins.  
Hiring Trailer including power & 5 phone lines 100% operational Monday of this week.  
Store Management Team Arrives to start Hiring Process.  
**Building Secured By End of Week.**
- T-3 Baler & Compactor Operational by End of the Week.  
Phone Trunk Lines Installed by Local Phone Company Life Safety Complete.  
Sensormatic Installation starts  
LP begins installing security cameras  
Saws & Vacuums, installed and operational  
Wire machine installed and operational  
Carpet Machines installed and operational  
Fire Extinguishers Delivered  
**Gas service to building operational**
- T-2 **Temporary Certificate of Occupancy** needed by End of Week!  
Power to Cash Registers  
Battery Chargers Operational by End of Week  
Set Paint Desk  
Parking Lot Complete  
Start In-Rack Electrical (desk's of priority)  
Pneumatic Tube begins  
In-rack Sprinklers Begins  
Fire Alarm Complete  
**Computer Room Finished**
- T-1 **IT INSTALL DATE - IT Phase 1 Computer Install. Equip/Data Room, Receiving, Time Clock & Front End Complete & Clean**  
  
**HVAC in Computer Room and Vault Operational.**  
**Mechanical Contractor to complete Equipment Startup Checklist for all equipment per Section 15730**  
**Class I and Class II Energy Management wiring complete**  
**GC to submit Energy Management Commissioning Pre-Visit Check-Off Sheet to EMS Startup Agent**  
Class I and Class II Energy Management wiring complete  
Radial Arm Saw & Panel Saw Operational.  
Power-up Fan Cloud, Light Pods & Other Electrical Department Items if Possible.  
Punch Walk.  
**Exide Battery Receptacle Installed.**  
**Security contractor's work complete. Fire In-Rack Complete (No Exceptions).**  
Vendors Come In To Set Beams and Wood Spacers (Stickers).  
Parking Lot Striping and Signage Complete.  
Landscape Irrigation and Plant Material Fully Installed and Operational.
- T **SUBSTANTIAL COMPLETION/TURNOVER/STORE POSSESSION/MERCHANDISE ARRIVAL!**  
**ALL** Site Work & Building (except Rack Electrical) Complete.  
Merchandising Starts.  
**EMS STARTUP – 1<sup>ST</sup> VISIT - EMS/HVAC/LIGHTING ALL OPERATIONAL** - Coordinate w/ Home Depot Controls Contractor.  
Phase 2 Begins.
- T+1 ITS Contractor Completes Paint Desk cabling and Continues with Phase Two Phone/Data at all Desks.
- T+3 Store Manager Makes Decision on Removing Hiring Trailer.
- T+4 **EMS STARUP – 2<sup>ND</sup> VISIT** – Coordinate w/ Home Depot Controls Contractor.
- T+5 Final Punch  
Rack Electric Complete.  
Coordinate w/ PM, AMM for Maintenance Grand Opening Punchwalk.
- T+5.5 **GRAND OPENING!**

**BENCHMARK SCHEDULE**  
(Holiday Schedule)

**PART 1 T-X SCHEDULE**

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- T-18 Building Pad Complete  
Begin Building Construction.
- T-17 Foundations  
Rough Electric  
Rough Plumbing Start.
- T-15 Start Slab  
Coordinate with Sensormatic.
- T-14 Start Forming Tilt Walls (if applicable).
- T-12 Tilt or Precast Walls Erected.
- T-10 Steel & Deck Complete  
Get Current Fixture Plan from PM.
- T-9 Roof On  
Electrical, Mechanical, Plumbing & Fire Sprinklers Started  
Fire and Burglar alarm conduit started by Electrical Contractor.
- T-8 **Utility Service to Building Complete: Permanent Power, Phone, Water, Sanitary, Gas (as applicable) and Storm Sewer**
- T-7 Start Painting Ceilings & Sales Floor.  
Get Final In-Rack Fire Plan From Consultant.  
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Data Room construction is complete.  
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Floors must be **SPOTLESS** by end of this week.  
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Baler/Compactor Arrives and installed/operational.  
Fire and Burglar alarm systems completed.  
**Site Paving Must Be Complete and Truck Dock Operational**

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Hiring Trailer including power & 5 phone lines 100% operational Monday of this week.  
Store Management Team Arrives to start Hiring Process.  
**Building Secured By End of Week.**
- T-3     Baler & Compactor Operational by End of the Week.  
Phone Trunk Lines Installed by Local Phone Company Life Safety Complete.  
Sensormatic Installation starts  
LP begins installing security cameras  
Saws/Vacuums installed and operational  
Wire machine installed and operational  
Carpet Machines installed and operational  
Fire Extinguishers Delivered.  
**Gas service to building operational**
- T-2     **Temporary Certificate of Occupancy** needed by End of Week!  
Power to Cash Registers, Battery Chargers Operational by End of Week  
Set Paint Desk.  
Parking Lot Complete  
Start In-Rack Electrical (desk's of priority)  
Pneumatic Tube begins  
In-rack Sprinklers Begins  
Fire Alarm Complete  
**Computer Room Finished.**
- T-1     **IT INSTALL DATE - IT Phase 1 Computer Install. Equip/Data Room, Receiving, Time Clock & Front End Complete & Clean, HVAC in Computer Room and Vault Operational.**  
**Mechanical Contractor to complete Equipment Startup Checklist for all equipment per Section 15730**  
**Class I and Class II Energy Management wiring complete**  
**GC to submit Energy Management Commissioning Pre-Visit Check-Off Sheet to EMS Startup Agent**  
Radial Arm Saw & Panel Saw Operational  
Power-up Fan Cloud, Light Pods & Other Electrical Department Items if Possible  
Punch Walk.  
**Exide Battery Receptacle Installed.**  
**Security contractor's work complete.**  
**Fire In-Rack Complete (No Exceptions).**  
Vendors Come In To Set Beams and Wood Spacers (Stickers).  
Parking Lot Striping and Signage Complete.  
Landscape Irrigation and Plant Material Fully Installed and Operational.
- T     **SUBSTANTIAL COMPLETION/TURNOVER/STORE POSSESSION/MERCHANDISE ARRIVAL!**  
**ALL Site Work & Building (except Rack Electrical) Complete.**  
Merchandising Starts.  
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Phase 2 Phones Begins.
- T+1     ITS Contractor Completes Paint Desk cabling and Continues with Phase Two Phone/Data at all Desks.
- T+4     Store Manager Makes Decision on Removing Hiring Trailer.
- T+5     **EMS STARUP – 2<sup>ND</sup> VISIT** – Coordinate w/ Home Depot Controls Contractor.
- T+6     Final Punch  
Rack Electric Complete.  
Coordinate with PM, AMM for Maintenance Grand Opening Punchwalk.
- T+6.5   **GRAND OPENING!**



**EXHIBIT G**  
**ALTERNATES**

**EXHIBIT H**  
**ALLOWANCES**

## **EXHIBIT I**

### **STORM WATER PENALTIES**

If Contractor fails to comply fully and timely with the requirements of Section 02370 of the Specifications (or Exhibit SW: Storm Water Management Specifications (02370) as may be attached to and included in this Contract in the event that this Contract does not include Specifications with Section 02370) or the terms of any applicable Storm Water Permit, upon written notice by Owner to Contractor, Contractor shall pay Owner Storm Water Penalties in the amounts set forth in the Schedule of Storm Water Penalties set forth below. If the Project is administered using Expesite, such notice by Owner may be sent to Contractor via a Project Notification in Expesite in lieu of sending such notice via mail.

All Storm Water Penalties owed to Owner under this Article shall be due and payable by Contractor within thirty (30) calendar days of Owner's notice to Contractor demanding payment of the penalties. All such payments shall be made by check to the order of an escrow account named by Owner in its notice to Contractor of a Storm Water Penalty. If payment is not made within the thirty (30) day period, the amount of Storm Water Penalty shall be credited against the Contract Sum.

Storm Water Penalties shall begin to accrue on the day after performance is due or the day a violation occurs and shall continue to accrue through the final day of the correction of the noncompliance or completion of the activity. Separate Storm Water Penalties may be assessed for separate violations even if such violations occur simultaneously. Storm Water Penalties shall accrue regardless of whether Owner has notified Contractor of a violation.

The payment of Storm Water Penalties shall not alter in any way Contractor's obligation to comply with any other requirement of this Contract, including without limitation the requirements of Section 02370 of the Specifications (or Exhibit SW: Storm Water Management Specifications (02370) as noted above) and the terms of any applicable Storm Water Permit .

Storm Water Penalties established herein are not the Owner's exclusive remedy for violations of the requirements of Section 02370 of the Specifications (or Exhibit SW: Storm Water Management Specifications (02370) as noted above) or the terms of any applicable Storm Water Permit. Owner expressly reserves the right to seek any other remedy otherwise available to it under this Contract, or at law or in equity.

#### **Schedule of Storm Water Penalties:**

1. For failure to submit a Notice of Intent or otherwise obtain a Storm Water Permit in Contractor's name as required by Section 02370 of the Specifications (or Exhibit SW: Storm Water Management Specifications (02370) as noted above) or the terms of any applicable Storm Water Permit, law or regulation, \$1,000 per day of violation;
2. For failure to provide the pre-construction contractor acknowledgment required by Section 02370 of the Specifications (or Exhibit SW: Storm Water Management Specifications (02370) as noted above), \$1000 per violation;
3. For Commencement of Soil Disturbance Activities (except for activities associated with the initial installation of BMP's at the Storm Water Site) (a) prior to the correct installation in the correct locations of all BMP's required by the SWPPP or (b) prior to receipt by Owner of Contractor's pre-construction

certification pursuant to Section 02370 of the Specifications (or Exhibit SW: Storm Water Management Specifications (02370) as noted above) that all BMP's required by the SWPPP have been correctly installed in the correct locations, \$5,000;

4. For each day after the Commencement of Soil Disturbance Activities (except for activities associated with the initial installation of BMP's at the Storm Water Site) and prior to receipt by Owner of Contractor's pre-construction certifications of compliance pursuant to Section 02370 of the Specifications (or Exhibit SW: Storm Water Management Specifications (02370) as noted above), \$500 per day per requirement that has not been certified;

5. For failure to update any SWPPP within the time required by Section 02370 of the Specifications (or Exhibit SW: Storm Water Management Specifications (02370) as noted above) or the terms of any applicable Storm Water Permit, \$1000 per day of violation;

6. For failure to install, repair, maintain, modify or add BMPs and to document the Storm Water Remediation, all as required by Section 02370 of the Specifications (or Exhibit SW: Storm Water Management Specifications (02370) as noted above) or the terms of any applicable Storm Water Permit, \$1500 per day of violation;

7. For failure to timely conduct an inspection on the schedule established by Section 02370 of the Specifications (or Exhibit SW: Storm Water Management Specifications (02370) noted above) or the terms of any applicable Storm Water Permit, \$1,000 for each missed inspection by a Project Superintendent;

8. For failure to perform or document an inspection in the manner required by Section 02370 of the Specifications (or Exhibit SW: Storm Water Management Specifications (02370) as noted above) or the terms of any applicable Storm Water Permit, \$1,000 for each such instance.

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**HOME DEPOT U.S.A., INC.**

**General Conditions of the Contract  
for Construction  
(HDGENCON)**

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**Rev. April 11, 2012**

**TABLE OF ARTICLES**

	<b><u>PAGE</u></b>
ARTICLE 1 - CONTRACT DOCUMENTS .....	4
ARTICLE 2 - ARCHITECT .....	7
ARTICLE 3 - OWNER.....	9
ARTICLE 4 - CONTRACTOR .....	12
ARTICLE 5 - SUBCONTRACTORS .....	21
ARTICLE 6 - WORK BY OWNER OR BY SEPARATE CONTRACTORS .....	24
ARTICLE 7 - MISCELLANEOUS PROVISIONS .....	26
ARTICLE 8 - TIME .....	32
ARTICLE 9 - PAYMENTS AND COMPLETION.....	34
ARTICLE 10 - PROTECTION OF PERSONS AND PROPERTY .....	42
ARTICLE 11 - INSURANCE.....	47
ARTICLE 12 - CHANGES IN THE WORK.....	49
ARTICLE 13 - CORRECTION OF WORK AND WARRANTIES .....	52
ARTICLE 14 - TERMINATION OF THE CONTRACT .....	54
ARTICLE 15 - MINORITY AND WOMEN BUSINESS ENTERPRISES.....	57

## **TABLE OF DEFINITIONS<sup>1</sup>**

AAA.....	7.8.1
Agreement.....	1.1.1
Application for Payment.....	9.3
Architect.....	2.1.1
Bulletins.....	1.1.5
Change Order.....	12.1.1
Commencement Date.....	8.1.2
Construction Work Directive.....	12.4
Continuation Sheet.....	9.2.1
Contract.....	1.1.2
Contract Documents.....	1.1.1
Contract Sum.....	9.1.1
Contract Time.....	8.1.1
Contractor.....	4.1.1
Date of Substantial Completion.....	A 3.1
Day.....	8.1.3
Drawings.....	1.1.7
Exesite.....	4.3.6
General Conditions.....	1.1.1
Governmental Authorities.....	1.1.10
Grand Opening Date.....	A 3.3
Home Depot Project Manager.....	1.2.8, 3.5
Install, installed.....	1.2.6
Job Site.....	1.1.4
Labor and Material Payment Bond.....	7.5.1
Legal Requirements.....	1.1.9
Liens.....	9.3.3
Or equivalent.....	4.4.4
Owner.....	3.1.1
Paragraphs.....	1.2.7
Performance Bond.....	7.5.1
Product Data.....	4.11.2
Project.....	1.1.4
Project Manual.....	1.1.6
Project Schedule.....	4.9
Provide, provided.....	1.2.5
Punch list.....	9.7.2
Reasonably inferable.....	4.4.6
Samples.....	4.11.3
Schedule of Values.....	9.2.1

---

<sup>1</sup> All references in the Table of Definitions are to sections of the General Conditions except for terms that are listed as “A\_\_\_\_\_”, which terms are contained in the Agreement.

Shop Drawings.....	4.11.1
Specifications.....	1.1.8
Standard of Care .....	4.4.5
Subcontract .....	5.2.1
Subcontractor .....	5.1.1
Sub-subcontractor .....	5.1.2
Subparagraphs.....	1.2.7
Substantial Completion.....	9.7.1
Work .....	1.1.3

# **GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION**

## **ARTICLE 1 - CONTRACT DOCUMENTS**

### **1.1 DEFINITIONS**

#### **1.1.1 THE CONTRACT DOCUMENTS**

The Contract Documents consist of the Agreement between Owner and Contractor (the “Agreement”), these General Conditions of the Contract (“General Conditions”), the Drawings, the Specifications, all addenda, Modifications identified in the Agreement, Modifications issued after execution of the Agreement and all other documents incorporated by the Contract Documents. A Modification is (1) a written amendment to the Contract signed by both Owner and Contractor, (2) a Change Order, (3) a written interpretation issued by Architect pursuant to Subparagraphs 2.2.6 or 2.2.7, (4) a written order for a minor change in the Work issued by Architect, or (5) a decision rendered by the Home Depot Project Manager or Architect pursuant to Subparagraph 2.2.5. The Contract Documents do not include bidding documents such as the advertisement or invitation to bid, the instructions to bidders, sample forms, Contractor's bid or portions of addenda relating to any of these, or any other documents, unless specifically identified as a Contract Document.

#### **1.1.2 THE CONTRACT**

The Contract Documents form the contract for construction (the “Contract”). This Contract represents the entire and integrated agreement between the parties hereto and supersedes all other prior negotiations, proposals, bids, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification as defined in Subparagraph 1.1.1. Nothing contained in the Contract Documents shall create any contractual relationship between Owner or Architect and any Subcontractor or Sub-subcontractor or between any persons or entities other than Owner and Contractor.

#### **1.1.3 THE WORK**

The Work comprises all of Contractor’s obligations under the Contract Documents, including without limitation, the completed construction required by the Contract Documents, all labor necessary to produce such construction, and all materials and equipment incorporated or to be incorporated into such construction. Contractor acknowledges and agrees that the Contract Documents are adequate and sufficient to provide for the completion of the Work, and include all Work, whether or not shown or described, which reasonably may be inferred to be required for the completion of the Work in accordance with all applicable Legal Requirements.



#### **1.1.4 THE PROJECT**

The Project is identified on page one of the Agreement and is the total construction of which the Work performed under the Contract Documents may be the whole or a part. The “Job Site” is the location or locations at which the Work is performed.

#### **1.1.5 BULLETINS**

Bulletins are written or graphic instruments prepared and issued by Architect. Bulletins interpret the Contract Documents by additions, deletions, clarifications, or corrections. Items of Work described in a Bulletin shall become a part of the Contract Documents only upon the issuance and approval of a Change Order by Owner authorizing such change(s).

#### **1.1.6 PROJECT MANUAL**

The Project Manual is the volume or volumes usually assembled for the Work and may include the bidding requirements, sample forms and certain of the Contract Documents such as the General Conditions and the Specifications.

#### **1.1.7 THE DRAWINGS**

The Drawings are the graphic and pictorial portions of the Contract Documents, wherever located and whenever issued, showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams.

#### **1.1.8 THE SPECIFICATIONS**

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, construction systems, standards of workmanship for the Work, and performance of related services.

#### **1.1.9 LEGAL REQUIREMENTS**

The term “Legal Requirements” shall mean (i) all federal, state, county, city and local laws, statutes, ordinances, codes, rules and regulations, and (ii) all permits issued by and all orders, decisions and requirements of all Governmental Authorities.

#### **1.1.10 GOVERNMENTAL AUTHORITIES**

The term “Governmental Authorities” shall mean all federal, state, county, city, local and municipal bodies having any jurisdiction over Owner, Contractor, Architect, the Job Site, the Work, or the Project or any portion thereof.

### **1.2 EXECUTION, CORRELATION AND INTENT**

**1.2.1** The Contract Documents shall be signed in not less than duplicate by Owner and Contractor.

- 1.2.2** Execution of the Agreement by Contractor is a representation that Contractor has carefully examined the Contract Documents and the Job Site, and that Contractor is thoroughly familiar with the nature and location of the Work, the Job Site, the specific and local conditions under which the Work is to be performed, and all matters which may in any way affect the Work or its performance. Contractor fully represents that as a result of such examinations and investigations, Contractor thoroughly understands the Contract Documents and their intent and purpose, and is familiar with all Legal Requirements applicable to the Work, and that Contractor will abide by same. Claims for additional time or additional compensation as a result of Contractor's failure to follow the foregoing procedure and to familiarize itself with all specific and local conditions and the Contract Documents will not be permitted.
- 1.2.3** The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work. The Contract Documents are complementary, and what is required by any one shall be as binding as if required by all. Words and abbreviations which have well-known technical or trade meanings are used in the Contract Documents in accordance with such recognized meanings. In the event of conflicting provisions, Specifications will take precedence over the Drawings; the more specific provision will take precedence over the less specific; the more stringent will take precedence over the less stringent; the more expensive item will take precedence over the less expensive; later Modifications or changes will supercede or take precedence over earlier provisions. On all Drawings, figures take precedence over scaled dimensions. Scaling of dimensions, if done, is done at Contractor's own risk.
- 1.2.4** The organization of the Specifications into divisions, sections and articles, and the arrangement of Drawings shall not control Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.
- 1.2.5** In all Contract Documents, the terms "provide" and "provided" shall mean furnish and install, and include, without limitation, labor, materials, equipment, transportation, services, and other items required to complete the Work.
- 1.2.6** In all Contract Documents, the terms "install", and "installed", shall mean: unload, unpack, and uncrate materials or equipment; remove packing materials from the Job Site; store, protect, assemble, move to area of use, set in place, connect to services, and make operational, unless otherwise specified.
- 1.2.7** To the extent not otherwise defined herein, capitalized terms herein shall have the meanings ascribed to such terms in the other Contract Documents. All references to "Paragraphs" or "Subparagraphs" herein shall refer to the Paragraphs or Subparagraphs, as the case may be, in these General Conditions.
- 1.2.8** The Home Depot Project Manager is the person appointed by Owner as Owner's representative for the Project. Such person may be an employee of Home Depot.

Owner reserves the right to appoint such other persons as Owner's representative in addition to or in lieu of the Home Depot Project Manager as Owner in Owner's sole discretion deems necessary or appropriate.

## **ARTICLE 2 - ARCHITECT**

### **2.1 DEFINITION**

- 2.1.1** Architect is the person lawfully licensed to practice architecture, or an entity lawfully practicing architecture, identified as such in the Agreement, and is referred to throughout the Contract Documents as if singular in number and masculine in gender.

### **2.2 ADMINISTRATION OF THE CONTRACT**

- 2.2.1** Architect will provide administration of the Contract as hereinafter described.
- 2.2.2** Architect will advise and consult with the Home Depot Project Manager (as defined in Section 2.2.14 below) when requested by Owner or when otherwise required to advise Owner pursuant to Architect's contractual obligations. Architect will have authority to act on behalf of Owner only to the extent provided in the Contract Documents, unless otherwise modified by written instrument in accordance with Subparagraph 2.2.12.
- 2.2.3** Neither Architect nor the Home Depot Project Manager will be responsible for, or have control or charge of, construction means, methods, techniques, sequences or procedures, or be responsible for safety precautions and programs in connection with the Work, and they will not be responsible for Contractor's failure to carry out the Work in accordance with the Contract Documents. Architect and the Home Depot Project Manager will not be responsible for or have control or charge over the acts or omissions of Contractor, Subcontractors, or any of their agents or employees, or any other persons performing any of the Work.
- 2.2.4** Architect shall at all times have access to the Work wherever it is in preparation and progress. Contractor shall provide facilities for such access so Architect may perform his functions under the Contract Documents.
- 2.2.5** Claims, disputes and other matters in question between Contractor and Owner relating to the performance of the Work or the interpretation of the Contract Documents may be decided by the Home Depot Project Manager which decision the Home Depot Project Manager shall endeavor to provide in writing within a reasonable time. The Home Depot Project Manager may refer any such claim or dispute to Architect. The Home Depot Project Manager's decision, or Architect's, if referred by or from the Home Depot Project Manager, shall be final and binding on Owner and Contractor.

- 2.2.6** If referred to Architect, all interpretations and decisions of Architect shall be consistent with the intent of and reasonably inferable from the Contract Documents and will be in writing or in the form of drawings. In his capacity as interpreter and advisor, he will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for the result of any interpretation or decision rendered in good faith in such capacity.
- 2.2.7** If Owner concurs, Architect's decisions in matters relating to aesthetic effect will be final if consistent with the intent of the Contract Documents.
- 2.2.8** If directed by the Home Depot Project Manager, Architect will be the interpreter of the requirements of the Contract Documents and advise Owner in evaluating the performance thereunder by both Owner and Contractor, and will have authority to reject Work which does not conform to the Contract Documents. Whenever, in his opinion, he considers it necessary or advisable for the implementation of the intent of the Contract Documents to require special inspection or testing of the Work in accordance with the procedure set forth by the Home Depot Project Manager in Subparagraph 7.7.2, whether or not such Work be then fabricated, installed or completed, he will promptly so advise the Home Depot Project Manager. However, neither Architect's authority to act under this Subparagraph 2.2.8, nor any decision made by him in good faith either to exercise or not exercise such authority, shall give rise to any duty or responsibility of Architect to Contractor, any Subcontractor, any of their agents or employees, or any other person performing any of the Work.
- 2.2.9** Architect will review and approve or take other appropriate action upon Contractor's submittals, such as Shop Drawings and Product Data and Samples, but only for conformance with the design concept of the Work and with the information given in the Contract Documents. Such action shall be taken with reasonable promptness so as to cause no delay to the critical path of the Work. Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component. Shop Drawings, Product Data, and Samples for Owner-supplied equipment will be forwarded to Contractor by Architect.
- 2.2.10** Architect, when requested by the Home Depot Project Manager, will assist Owner in conducting inspections to determine the dates of Substantial Completion and final completion.
- 2.2.11** If Owner and Architect agree, Architect will provide one or more project representatives to assist Architect in carrying out his responsibilities.
- 2.2.12** The duties, responsibilities, and limitations of authority of Architect as Owner's representative during construction as set forth in the Contract Documents will not be modified or extended without written consent of Owner and Architect which will be shown to Contractor upon request.

- 2.2.13** In case of the termination of Architect, Owner may appoint an architect whose status under the Contract Documents shall be that of the former Architect.
- 2.2.14** All instructions, interpretations, and decisions of Architect shall be forwarded to Contractor through the Home Depot Project Manager.

### **ARTICLE 3 - OWNER**

#### **3.1 DEFINITION**

- 3.1.1** Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number and masculine in gender. The term Owner means Owner or his authorized representative.

#### **3.2 INFORMATION AND SERVICES REQUIRED OF OWNER**

- 3.2.1** To the extent in Owner's possession and requested by, or provided to Contractor, Owner shall furnish surveys describing physical characteristics, soil or geotechnical information, legal limitations and utility locations for the Job Site of the Project, and a legal description of the Job Site. Contractor shall, within twenty-one (21) days after receipt of any information furnished by Owner pursuant to this Paragraph 3.2.1, verify and confirm the completeness and accuracy of information so furnished. In the event of any inaccuracies or errors or omissions, Contractor shall promptly notify Owner of all such inaccuracies, errors or omissions in writing. Failure to so notify Owner shall bar any claims by Contractor arising from the inaccuracy or incompleteness of any such information.
- 3.2.2** Owner shall secure and pay for necessary approvals, easements, assessments and charges required for the construction, use or occupancy of permanent structures or for permanent changes in existing facilities.
- (1) Owner will secure and pay for the general building permit for the Project including impact fees, plan check fees, and other fees customarily charged for the general building permit. In the event Contractor, with Owner's approval, secures and pays for the general building permit for the Project or for the other fees specified in this Paragraph 3.2.2(1), Owner shall reimburse Contractor for the actual cost of the permit and in no event shall such fees and costs be subject to, or include, an additional cost for Contractor's fee.
- (2) Owner will pay for the certificate of occupancy for the Project.
- 3.2.3** Information or services under Owner's control shall be furnished by Owner upon request of Contractor.

- 3.2.4** To the extent Owner provides Contractor with tests, studies, soils investigation reports, maps or other reports in connection with Job Site or material conditions, other than the Contract Documents, such tests, studies and reports shall be deemed to be for the benefit of Owner. Owner shall not be responsible for nor assume any responsibility for conclusions that Contractor may draw therefrom. Contractor waives any claims for inaccuracy, misrepresentation, inappropriateness or incompleteness relating to such items.
- 3.2.5** Unless otherwise provided in the Contract Documents, if requested, Contractor will be furnished, free of charge, one set of sepias and a set of blueprints with bound Specifications.
- 3.2.6** The foregoing are in addition to other duties and responsibilities of Owner enumerated herein and especially those in respect to the following sections of the General Conditions, "Work by Owner or by Separate Contractors," "Payments and Completion," and "Insurance" in Articles 6, 9 and 11 respectively.

### **3.3 OWNER'S RIGHT TO STOP THE WORK**

- 3.3.1** If Contractor fails to correct defective Work as required by Paragraph 13.2 or fails to carry out the Work in accordance with the Contract Documents, Owner, by a written order signed by the Home Depot Project Manager, may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated or otherwise remedied. Notwithstanding the preceding sentence, however, neither Owner's right to stop the Work, nor any decision made by Owner in good faith either to exercise or not to exercise its authority to act hereunder, will give rise to any duty or responsibility of Owner or Owner's representative to Contractor, any Subcontractor, any of their agents or employees, or any other person performing any of the Work or otherwise, including without limitation, any duty to exercise the right for the benefit of Contractor or any other person or entity. This right shall be in addition to and not in restriction of Owner's rights under Article 13.

### **3.4 OWNER'S RIGHT TO CARRY OUT THE WORK**

- 3.4.1** If Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within three days after receipt of written notice from Owner to commence and continue correction of such default or neglect with diligence and promptness, Owner, without prejudice to any other remedy he may have and without obligation to do so, may commence and continue to carry out the Work and all costs actually incurred by Owner shall be a credit against the Contract Sum. In such case an appropriate Change Order shall be issued deducting from the payments then or thereafter due Contractor the cost of correcting such deficiencies, including compensation for additional services made necessary by such default, neglect or failure. If the payments then or thereafter due Contractor are not sufficient to cover such amount, Contractor shall promptly pay the difference to Owner.

### **3.5 OWNER'S REPRESENTATIVE (HOME DEPOT PROJECT MANAGER)**

- 3.5.1** The Home Depot Project Manager shall be Owner's representative for purposes of this Agreement and as such communications and instructions of Owner or Architect to Contractor may be issued through the Home Depot Project Manager.
- 3.5.2** The Home Depot Project Manager will at all times have access to the Work wherever it is in preparation and progress. Contractor shall provide facilities for such access.
- 3.5.3** The Home Depot Project Manager will review, and approve or reject, Contractor's Application for Payment as provided in Paragraphs 9.4 and 9.5.
- 3.5.4** The Home Depot Project Manager will have authority to reject Work which does not conform to the Contract Documents. Whenever, in his opinion, he considers it necessary or advisable for the implementation of the intent of the Contract Documents, he will have authority to require special inspection or testing of the Work in accordance with Subparagraph 7.7.2 whether or not such Work be then fabricated, installed, or completed. However, neither the Home Depot Project Manager's authority to act under this Subparagraph 3.5.4, nor any decision made by him in good faith either to exercise or not to exercise such authority, will give rise to any duty or responsibility of the Home Depot Project Manager or Owner to Contractor, any Subcontractor, any of their agents or employees, or any other person performing any of the Work.
- 3.5.5** The Home Depot Project Manager will issue Change Orders or otherwise order changes in accordance with Article 12, and will also have authority to order changes in the Work as provided in Subparagraph 12.1.4.
- 3.5.6** The Home Depot Project Manager will conduct inspections to determine the dates of Substantial Completion and final completion, will receive written warranties and related documents required by the Contract and assembled by Contractor and will approve Contractor's final Application for Payment upon compliance with the requirements of Paragraph 9.8.

### **3.6 LOAN DOCUMENTS**

- 3.6.1** If Owner shall have furnished to Contractor a construction loan agreement or similar agreement between Owner and any lender for the Project, Contractor agrees fully to cooperate with Owner in complying with the provisions thereof and agrees to furnish any and all information, reports and certificates which are required or helpful thereunder.



### **3.7 LEASE AND DEVELOPMENT AGREEMENT DOCUMENTS**

- 3.7.1** If Owner has entered into an agreement with Owner's landlord, a development agreement between Owner and a third party, or a similar agreement concerning the Project, Contractor agrees to cooperate with and assist Owner in complying with the provisions thereof, and agrees to furnish any and all information, reports and certificates which are required or helpful thereunder. Owner shall furnish Contractor copies of relevant portions of the agreements upon request.

## **ARTICLE 4 - CONTRACTOR**

### **4.1 DEFINITION**

- 4.1.1** Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number and masculine in gender. The term Contractor means Contractor or his authorized representative. Contractor warrants it is licensed in the state where the Job Site is located and will remain licensed throughout the duration of the Work.

### **4.2 REVIEW OF CONTRACT DOCUMENTS**

- 4.2.1** Contractor shall carefully study and compare each of the Contract Documents with the other Contract Documents and shall at once report to Architect and to the Home Depot Project Manager any error, inconsistency or omission Contractor may discover. Contractor hereby specifically acknowledges that the Contract Documents are complete and sufficient to have enabled it to determine the Contract Sum and that the Drawings, the Specifications and all addenda are sufficient to enable Contractor to construct the Work outlined in the Contract Documents. In addition, if Contractor performs any construction and if he knows or should have known that any of the Contract Documents contains an error, defect, inconsistency or omission, Contractor shall be responsible for such performance and shall bear the cost for correction thereof. Contractor shall perform no portion of the Work at any time without the Contract Documents or, where required, approved Shop Drawings, Product Data or Samples for such portion of the Work.
- 4.2.2** To the extent Contractor knows or should have known that a discrepancy exists between actual field conditions and the Contract Documents, Contractor shall take field measurements and verify field conditions and shall carefully compare such field measurements and conditions and other information known to Contractor with the Contract Documents before commencing activities. Errors, inconsistencies or omissions discovered shall be reported immediately to the Home Depot Project Manager. No extra charge or compensation shall be allowed on account of differences between actual dimensions and the measurements indicated on the Contract Documents.



### **4.3 SUPERVISION AND CONSTRUCTION PROCEDURES**

- 4.3.1** Contractor shall supervise and direct the Work, using his best skill and attention. He shall be solely responsible for all construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract.
- 4.3.2** Contractor shall be responsible to Owner for the acts and omissions of Contractor's agents, and employees, Subcontractors and their, agents and employees, Sub-subcontractors, suppliers and all other persons performing any of the Work under an agreement with or for Contractor.
- 4.3.3** Contractor shall not be relieved from his obligations to perform the Work in accordance with the Contract Documents either by the activities or duties of Architect in his administration of the Contract, by the activities or duties of the Home Depot Project Manager, or by inspections, tests, or approvals required or performed under Paragraph 7.7 by persons other than Contractor.
- 4.3.4** Contractor shall inspect all materials delivered to the Job Site and shall reject, within two (2) business days after receiving delivery of such materials, any materials that will not conform with the Contract Documents when such materials are properly installed.
- 4.3.5** If any of the Work is required to be inspected or approved by any public authority, Contractor shall cause such inspection or approval to be performed. No inspection performed or failed to be performed by Owner hereunder shall be a waiver of any of Contractor's obligations hereunder or be construed as an approval or acceptance of the Work or any part thereof.
- 4.3.6** Contractor shall utilize and follow all Owner requirements for Owner's communication and construction project management software known as "Expesite" or any other technology that Owner may require during the course of the Project at Contractor's sole expense. Owner requirements to use Expesite may include, without limitation, the utilization of the Project Task, Request for Proposal ("RFP"), Notification and uploading of documentation features.

### **4.4 LABOR AND MATERIALS**

- 4.4.1** Unless otherwise provided in the Contract Documents, Contractor shall provide and pay for all labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for the proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.
- 4.4.2** Contractor shall at all times; (i) enforce strict discipline and good order among his employees and Subcontractors, (ii) use best efforts to avoid labor disputes, and (iii) adequately staff the Project at all times in a manner appropriate, in the Home Depot

Project Manager's opinion, for the stage of construction then underway. Contractor shall not employ on the Project any unfit person or anyone not skilled in the task assigned to him.

- 4.4.3** Materials specified by reference to the number or symbol of a specified standard, such as commercial standard, a federal specification or other similar standard, shall comply with requirements in the latest revision thereof, and any amendment or supplement thereto, except as limited to type, class or grade as modified in such reference. The standards referred to, except as modified in the Contract Documents, shall have full force and effect as though printed therein.
- 4.4.4** Specific reference by the Contract Documents to any article, device, product material, fixture, form or type of construction, etc., by name, make or catalog number shall be interpreted as establishing a standard of quality and where stated as "or equivalent" shall not be construed as limiting competition, and Contractor in such cases, may, at its option, use any article, device, product or material, fixture or type of construction which, in the judgment of Architect and Owner, expressed in writing, is equal to that named. In those cases where "or equivalent" is not used, the product specified shall be used, unless amended by Architect or Owner.
- 4.4.5** Contractor accepts the relationship of trust and confidence established between it and Owner by the Contract. Contractor shall perform and complete its obligations under this Contract in strict accordance with the following: (i) the standard of care, diligence and skill for a contractor that (a) is experienced and skilled in the construction of retail, storage and warehouse facilities of the quality, complexity, size, nature, and location comparable to the Project, and (b) is familiar with the site upon which the Project is to be constructed and is familiar with local conditions under which the Work is to be performed (such care, diligence and skill as described by clause (i) is the "Standard of Care"), and (ii) the requirements of the Contract Documents. Contractor agrees to furnish its care, diligence and skill, and exercise judgment, consistent with the Standard of Care and as necessary to fulfill its duties under the Contract Documents. Contractor agrees to furnish efficient business administration and superintendence, to furnish at all times an adequate supply of workers and materials necessary to comply strictly with the requirements of the Contract Documents, and to perform the Work in the most expeditious and economical manner consistent with the interests of Owner. Contractor further agrees that it will perform all Work, including but not limited to, items of Work that are reasonably inferable from the Contract Documents in accordance with all Legal Requirements.
- 4.4.6** Without limitation, an item or work is hereby deemed "reasonably inferable" from the Contract Documents to the extent that such item or work: (i) would be provided or furnished by other contractors performing similar work, (ii) is customarily provided or furnished, or reasonably expected, in connection with work of a nature or of a quality similar to the Project, (iii) is needed or advisable for the proper operation, use or maintenance of any item of Work described, depicted or indicated in the Contract

Documents, or (iv) is needed or manufacturer recommended to complete a system of which any part is described, depicted or indicated in the Contract Documents. Therefore, by way of example only, Contractor agrees: (a) that if a sink is shown on Drawings, but supply and drain piping, and venting, are not indicated elsewhere in the Contract Documents, Contractor shall provide all such appropriate piping, venting and other related work as part of the Work, without adjustment to the Contract Sum or Contract Time, and (b) that if an exhaust fan is shown on a Drawing, and it is reasonable to conclude that for a Project of this type and quality that such fan should be ducted to another location, even if such ductwork is not indicated elsewhere in the Contract Documents, Contractor shall provide all such appropriate duct work and related work as part of the Work, without adjustment to the Contract Sum or Contract Time.

## **4.5 WARRANTY**

- 4.5.1** Contractor warrants to Owner that all materials and equipment furnished under this Contract will be of good quality and new unless otherwise specified, and that all Work will be of good quality, free from faults and defects, and all materials and the Work shall be in conformance with the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. If required by Owner, Contractor shall furnish satisfactory evidence to Owner and Architect as to the kind and quality of materials and equipment. This warranty is not limited by the provisions of Paragraph 13.2. This warranty applies to both patent and latent defects. This warranty shall not be limited to the durations set forth in Paragraph 13.2.2.

## **4.6 TAXES**

- 4.6.1** Contractor shall pay all sales, consumer, use and other similar taxes for the Work or portions thereof provided by Contractor that are legally enacted at the time bids or proposals are received, whether or not yet effective, or merely scheduled to go into effect, including, but not limited to, all sales taxes, use taxes, occupational taxes, excise taxes, social security benefits, unemployment compensation taxes, or similar levies on all materials, labor, tools and equipment furnished under the Contract Documents, as required by Legal Requirements where the Project is located. Contractor hereby consents to Owner's withholding of taxes from the Contract Sum to the extent required by Legal Requirements. Contractor shall comply with Legal Requirements mandated by local jurisdictions requiring Contractor to register with Governmental Authorities in accordance with applicable tax laws or any other applicable Legal Requirements. Contractor shall, upon execution of the Contract, submit to Owner proof that Contractor has registered with the appropriate Governmental Authority for tax purposes to the extent such registration is required in the location of the Project. To the fullest extent permitted by law, Contractor, its Subcontractors, and any entity for whose acts either of them may be responsible shall indemnify, defend and hold harmless Owner and its related and affiliated entities,

Owner's landlord or developer, if any, and their respective partners, directors, officers, agents, and employees, against any losses, claims, fines, penalties, judgments, liens, fees, damages, costs or expenses, including, but not limited to, attorneys' fees and costs and experts' fees and costs (collectively "Losses") imposed on or incurred by the indemnified parties in this Paragraph 4.6.1 as a result of Contractor's failure to comply with any Legal Requirement applicable to this Paragraph 4.6.1. This Paragraph 4.6.1 shall survive the expiration, completion, or earlier termination of the Contract.

#### **4.7 PERMITS, FEES, NOTICES AND LEGAL REQUIREMENTS**

- 4.7.1** Except as provided in Subparagraph 3.2.2, Contractor shall secure and pay for all permits and governmental fees, licenses, and inspections necessary for the proper execution and completion of the Work which are customarily secured after execution of the Contract and which are legally required at the time the bids are received.
- 4.7.2** Contractor shall comply with and give all notices required by all applicable Legal Requirements bearing on the performance of the Work including, without limitation, the obligation to file a notice of commencement of the Work, notice of completion, or similar notices to the extent applicable in the state where the Project is located. If Contractor fails to give such notices, it shall be liable for and shall defend, indemnify and hold harmless Owner, Owner's landlord or developer if any, and Architect, and their respective employees, officers and agents, against any resulting fines, penalties, judgments, liens or damages, including reasonable attorneys' fees, imposed on or incurred by the parties indemnified hereunder.
- 4.7.3** It shall be the obligation of Contractor to review the Contract Documents to determine and to notify Owner and Architect of any discrepancy between the Contract Documents and Legal Requirements of which Contractor has knowledge or should be reasonably able to determine. Contractor shall not violate any zoning, setback or other locational requirements of applicable Legal Requirements, or of any recorded covenants of which Contractor has or should have had knowledge. If Contractor observes that portions of the Contract Documents are at variance with applicable Legal Requirements, Contractor promptly shall notify Owner and Architect in writing, and necessary changes shall be accomplished by appropriate Modification.
- 4.7.4** If Contractor performs any Work which Contractor knows or should have known to be contrary to Legal Requirements, and without such notice to Owner, Contractor shall assume full responsibility therefor and shall bear all costs attributable thereto.
- 4.7.5** Copies of any and all permits, licenses and certificates shall be delivered to the Home Depot Project Manager as soon as they are obtained. Along with the request for final payment, Contractor shall deliver the originals of such permits, licenses and certificates to the Home Depot Project Manager.

- 4.7.6** Contractor is solely responsible to ensure that all of its employees and Subcontractors who perform Work on the Project are in compliance with the Immigration Reform and Control Act of 1986 ("IRCA"). Contractor shall only employ individuals to work at the Project for whom Contractor has confirmed legal eligibility to work lawfully in the United States. Contractor shall include in all of its Subcontracts a provision requiring its Subcontractors to adhere to the provisions of this Paragraph. To the fullest extent permitted by law, Contractor, its Subcontractors and any entity for whose acts either of them may be responsible, shall indemnify, defend and hold Owner and its related and affiliated entities, as well as each of their respective partners, directors, officers, agents and employees, harmless from and against any and all loss, cost, liability or expense (including but not limited to, attorneys' fees) arising out of or alleged to have arisen out of in whole or in part Contractor's, Subcontractor's or any entity for whose acts any them may be liable for failing to adhere to the provisions of this Paragraph.

#### **4.8 SUPERINTENDENT**

- 4.8.1** Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Job Site during the progress of the Work. The superintendent shall represent Contractor and all communications given to the superintendent shall be as binding as if given to Contractor. Owner shall confirm communications in writing upon written request. Owner reserves the right to approve the appointment by Contractor of its superintendent for the Project.

#### **4.9 PROJECT SCHEDULE**

- 4.9.1** Contractor, with the assistance of Owner, promptly after being awarded the Contract, but in no event later than twenty (20) days after notice of award of the Contract, shall develop and maintain a Project Schedule consisting of a computer generated network schedule or another scheduling method approved by Owner, and shall update and distribute the schedule as required by Owner or otherwise necessary to inform all parties of the status of the Project, but no less frequently than once monthly. Contractor shall give Owner the opportunity to assist in the preparation and updating of the schedule, which Owner may do at its option. The Project Schedule is attached as **Exhibit F** to the Agreement.
- 4.9.2** Contractor acknowledges that Owner may retain the services of an independent third party construction manager or other representative at Owner's expense. Contractor shall cooperate with any such representative in all respects as may affect the Project or the Work, including, without limitation, regard to the preparation of the Project Schedule.
- 4.9.3** To the extent requested by the Home Depot Project Manager, Contractor shall have weekly progress meetings at the Job Site. Progress of the Work shall be reported in detail with reference to the Project Schedule. Each interested Subcontractor shall

present a competent representative to report the condition of his Work and to receive information.

#### **4.10 DOCUMENTS AND SAMPLES AT THE JOB SITE**

**4.10.1** Contractor shall maintain at the Job Site for Owner, one copy of all Drawings, Specifications, addenda, Change Orders and other Modifications, in good order and marked currently to record all changes made during construction, and, in addition, approved Shop Drawings, Product Data, and Samples. These shall be available to Architect and Owner and shall be delivered to Owner by Contractor as part of Contractor's application for final payment.

**4.10.2** Contractor shall maintain all approved permit drawings in a manner so as to make them accessible to Governmental Authorities. All approved Drawings shall be wrapped, marked and delivered to Owner within sixty (60) days of final completion of the Work as a condition precedent to final payment.

#### **4.11 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES**

**4.11.1** Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by Contractor or any Subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

**4.11.2** Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by Contractor to illustrate a material, product or system for some portion of the Work.

**4.11.3** Samples are physical examples which illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

**4.11.4** Contractor shall review, approve and submit, within thirty (30) days after the notice to proceed is issued and in such sequence as to cause no delay in the Work or in the work of Owner or any separate contractor, all Shop Drawings, Product Data and Samples required by the Contract Documents.

**4.11.5** By approving and submitting Shop Drawings, Product Data and Samples, Contractor represents that he has determined and verified all materials, field measurements, and field construction criteria related thereto, or will do so, and that he has checked and coordinated the information contained within such submittal with the requirements of the Work and the Contract Documents. Contractor shall obtain from Architect, Shop Drawings and Product Data of all Owner-supplied equipment. He shall review and return a copy to Architect indicating comments and approval. Approval shall represent that field conditions have been checked, and will be coordinated to receive Owner-supplied equipment.



- 4.11.6** Contractor shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents by Architect's approval of Shop Drawings, Product Data, or Samples under Subparagraph 2.2.9 unless Contractor has specifically informed Architect and the Home Depot Project Manager by separate writing of such deviation at the time of submission and Architect has given written approval to the specific deviation. Contractor shall not be relieved from responsibility for errors or omissions in the Shop Drawings, Product Data, or Samples by Architect's approval thereof.
- 4.11.7** Contractor shall direct specific attention, in writing or noted on resubmitted Shop Drawings, Product Data, or Samples, to revisions other than those requested by Architect on previous submittals.
- 4.11.8** No portion of the Work requiring submission of Shop Drawings, Product Data, or Samples shall be commenced until the submittal has been approved by Architect as provided in subparagraph 2.2.9. All such portions of the Work shall be in accordance with the approved submittal.
- 4.11.9** Contractor shall furnish copies of approved Shop Drawings, Product Data, and Samples to other separate contractors and Subcontractors as may be necessary to coordinate their Work, or upon their request.

#### **4.12 USE OF JOB SITE**

- 4.12.1** Contractor shall confine operations at the Job Site to areas permitted by applicable Legal Requirements and the Contract Documents and shall not unreasonably encumber the Job Site with any materials or equipment.

#### **4.13 CUTTING AND PATCHING OF WORK**

- 4.13.1** Contractor shall be responsible for all cutting, fitting, or patching that may be required to complete the Work or make its several parts fit together properly, except as otherwise specifically provided in the Contract Documents.
- 4.13.2** Contractor shall not damage or endanger any portion of the Work or the work of Owner or any separate contractors by cutting, patching or otherwise altering any work, or by excavation. Contractor shall not cut or otherwise alter the work of Owner or any separate contractor except with the written consent of Owner and of such separate contractor. Contractor shall not unreasonably withhold from Owner or any separate contractor his consent to cutting or otherwise altering the Work.
- 4.13.3** Cutting shall be accurately located and neatly done. Unnecessary cutting shall be avoided.

**4.13.4** Patching shall be done by skilled mechanics experienced in the particular type of work involved. Patching work shall conform to the standards of the Specifications where specified, and where not specified, Work shall conform to the highest standards of the trade. Patching work shall be acceptable to Owner upon completion of the Work which has been patched.

**4.13.5** Contractor shall leave all holes, chases, and other openings in his Work required by separate contractors of Owner (if any) for the installation of their work, provided such openings are accurately located by the party requiring them before the execution of their construction work. Contractor shall afford separate contractors of Owner a reasonable opportunity to locate such openings.

#### **4.14 CLEANING UP**

**4.14.1** Contractor at all times shall keep the Job Site free from accumulation of waste materials or rubbish caused by his operations under the Contract. At the completion of the Work, he shall remove all his waste materials and rubbish from and about the Job Site and the Project as well as all of his tools, construction equipment, machinery and surplus materials. Contractor shall maintain streets and sidewalks around the Job Site in a clean condition. Contractor shall remove all spillage and tracking arising from the performance of the Work from such areas, subject to Owner's approval, and shall establish a regular maintenance program of sweeping and hosing to minimize accumulation of dirt and dust upon such areas.

**4.14.2** If Contractor fails to clean up at the completion of the Work, Owner may do so as provided in Paragraph 3.4 and the cost thereof shall be charged to Contractor.

#### **4.15 COMMUNICATIONS**

**4.15.1** Except as directed otherwise by Owner, Contractor shall submit Shop Drawings and Product Data directly to Architect. Contractor shall direct all other communications to Architect or Owner through the Home Depot Project Manager.

#### **4.16 ROYALTIES AND PATENTS**

**4.16.1** Contractor shall pay all royalties and license fees. He shall defend all suits or claims for infringement of any patent rights and shall indemnify Owner against and save Owner harmless from loss on account thereof, except that Owner shall be responsible for all such loss when a particular design, process or the product of a particular manufacturer or manufacturers is specified, but if Contractor has reason to believe that the design, process or product specified is an infringement of a patent, he shall be responsible for such loss unless he promptly gives such information to Owner.



## **4.17 INDEMNIFICATION**

**4.17.1** To the fullest extent permitted by law, Contractor shall indemnify, hold harmless and defend, at no cost to Owner, Owner, Architect, Owner's landlord if any, Owner's developer if any, and their agents and employees, from all claims, losses, damages, costs, and expenses of any type arising from all claims of Subcontractors, Sub-subcontractors, suppliers, or others, including but not limited to all claims for personal or bodily injury to or sickness, illness, or death of persons, or damage to or destruction of property including, without limitation, property and employees of Owner and Architect, occurring wholly or in part, as a result of the Work done or omitted to be done by, or contracted to be done but not done by, Contractor or his Subcontractors, Sub-subcontractors, or the employees, agents, or anyone for whose acts any of them may be liable, except for claims caused by or resulting from the sole negligence of the indemnitee.

Owner reserves the right to approve or reject any counsel, expert or consultant intended to represent or work on Owner's behalf in fulfillment of the foregoing defense and indemnity obligations. Owner further reserves the right to supplement or hire additional or other counsel, experts or other consultants as Owner deems necessary to assure adequate defense and indemnity of Owner's interests. Contractor shall be responsible for and shall promptly pay all costs and expenses arising from or relating to all such counsel, experts or other consultants and the defense and indemnity obligations hereunder.

In addition to any indemnification required under this Paragraph 4.17, Contractor shall purchase insurance for the benefit of Owner, Architect, Owner's landlord if any, Owner's developer if any, and their agents and employees in accordance with Article 11, which shall provide insurance coverage for them from any loss due to any and all claims, damages, losses, costs and expenses, including, but not limited to, claims for personal or bodily injury, sickness, disease and death and injury to and destruction of tangible property, along with any and all claims of Subcontractors or suppliers for damages arising out of the Project in an amount not less than \$3,000,000 per occurrence with an aggregate limit of not less than \$10,000,000. Contractor shall also indemnify and defend Owner, and Owner's developers, lenders or landlords, if any, against and shall hold Owner and Owner's developers, lenders or landlords, if any, harmless from any assertion of claims of any type of Subcontractors, Sub-subcontractors, suppliers or others, and claims for, or filing of, mechanics' or materialmen's liens by Contractor or its Subcontractors, Sub-subcontractors or material suppliers and against any assertion of security interests by suppliers of goods or materials, except for claims caused by or resulting from the sole negligence of an indemnitee.

**4.17.2** In any and all claims against Owner or Architect or any of their agents or employees by any employee of Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the

indemnification obligation under this Paragraph 4.17 shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for Contractor or any Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

#### **4.18 COORDINATION WITH OWNER'S LENDER**

**4.18.1** Contractor shall provide all documents, reports and other information requested by any lender, escrow under any construction loan escrow or title insurer and shall cooperate with such lender, escrowee or insurer to the fullest extent possible.

**4.18.2** If Owner's lender, if any, shall designate an inspecting architect or other representative, Owner may require the concurrence of such architect or representative in each instance in which the approval of Architect is required by any provision of these General Conditions or other Contract Documents. Contractor shall cooperate with such inspecting architect or representative to the fullest extent possible.

#### **4.19 SURVIVAL**

**4.19.1** The provisions of this Article 4 shall survive the completion, breach, expiration or termination of this Contract.

### **ARTICLE 5 - SUBCONTRACTORS**

#### **5.1 DEFINITION**

**5.1.1** A Subcontractor is a person or entity of any tier who has a direct contract with Contractor or another Subcontractor to perform any of the Work at the Job Site. The term Subcontractor is referred to throughout the Contract Documents as if singular in number and masculine in gender and means a Subcontractor, Sub-subcontractor or his authorized representative.

**5.1.2** A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform any of the Work at the Job Site. The term Sub-subcontractor is referred to throughout the Contract Documents as if singular in number and masculine in gender and means a Subcontractor, Sub-subcontractor or his authorized representative thereof.

#### **5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK**

**5.2.1** All portions of the Work that Contractor's organization has not been accustomed to performing shall be performed by another party that is experienced and competent under a Subcontract or other appropriate agreement with Contractor. The term "Subcontract" shall mean the form of agreement between Contractor and a first-tier

Subcontractor pursuant to which a first-tier Subcontractor is to provide labor, materials, services and/or equipment for the Work, including, but not limited to, all extensions or modifications to any of the foregoing. Subcontract shall include, without limitation, all leases for equipment. Contractor shall request bids from Subcontractors and shall deliver such bids to Owner. Owner may determine which bids will be accepted. Owner may also direct that additional (or fewer) portions of the Work be subcontracted, if in Owner's reasonable assessment Contractor is not sufficiently experienced or competent to perform such portions of the Work.

**5.2.2** Contractor shall make no substitution for any Subcontractor, person or entity previously selected if Owner or Architect makes reasonable objection to such substitution.

**5.2.3** Contractor's responsibility to furnish materials, products, and equipment in conformance with the requirements of the Contract Documents shall not be changed or limited by Owner's lack of reasonable objection to any selected Subcontractor. Copies of all bids or other proposals from Subcontractors and Sub-subcontractors shall, upon the request of Owner, be submitted to Owner for review. All Subcontractors and Sub-subcontractors shall be subject to the approval of Owner.

### **5.3 SUBCONTRACTUAL RELATIONS**

**5.3.1** By an appropriate written agreement, Contractor shall require each Subcontractor, to the extent of the Work to be performed by Subcontractor, to be bound to Contractor by the terms of the Contract Documents, and to assume toward Contractor all the obligations and responsibilities which Contractor, by these Contract Documents, assumes toward Owner and Architect, including, without limitation, the General Conditions of this Agreement, the Drawings, Specifications and other Contract Documents and/or requirements. Said agreement shall preserve and protect the rights of Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that the subcontracting thereof will not prejudice such rights. Where appropriate, Contractor shall require each Subcontractor to enter into similar agreements with his Sub-subcontractors. Contractor shall make available to each proposed Subcontractor, prior to the execution of the Subcontract, copies of the Contract Documents to which the Subcontractor will be bound by this Paragraph 5.3, and identify to the Subcontractor any terms and conditions of the proposed Subcontract which may be at variance with the Contract Documents. Each Subcontractor shall similarly make copies of such documents available to his Sub-subcontractors. Notwithstanding the insurance amounts required by Section 11.1.2(2) of these General Conditions, the policy amounts required to be maintained by the Subcontractors and Sub-subcontractors shall be reduced from Three Million Dollars (\$3,000,000) to One Million Dollars (\$1,000,000) for both bodily injury and property. All other provisions of Section 11.1.2 shall remain applicable to the Subcontractors and Sub-subcontractors.

**5.3.2** Any part of the Work performed for Contractor by a Subcontractor or its Sub-subcontractor shall be pursuant to a written Subcontract between Contractor and such Subcontractor (or the Subcontractor and its Sub-subcontractor at any tier), which shall be prepared on a form of Subcontract satisfactory to Owner in all respects. Each such Subcontract shall, where the context so requires, contain provisions that:

- (1) require that such Work be performed in accordance with the Contract Documents;
- (2) waive all rights the contracting parties may have against one another or that the Subcontractor may have against Owner for damages caused by fire or other perils covered by the insurance described in the Contract Documents;
- (3) require the Subcontractor to carry and maintain insurance coverage in accordance with the Contract Documents, and to file certificates of such coverage with Contractor;
- (4) require the Subcontractor to submit certificates and waivers of claims and liens for work completed by it and by its Sub-subcontractors as a condition to the disbursement of the progress payment next due and owing;
- (5) require submission to Contractor or Subcontractor, as the case may be, of applications for payment in a form approved by Owner, together with clearly defined invoices and billings supporting all such applications under each Subcontract to which Contractor is a party;
- (6) report, so far as practicable, unit prices and any other feasible formula for use in the determination of costs of changes in the Work;
- (7) require each Subcontractor to furnish to Contractor in a timely fashion all information necessary for the preparation and submission of the reports required herein;
- (8) at Owner's option, require that each Subcontractor continue to perform under its Subcontract in the event the Contract is terminated and Owner requests such Subcontractor to continue such performance, and Owner shall be liable only for Work subsequently performed; and
- (9) require each Subcontractor to remove on a daily basis all debris created by its activities.
- (10) require each Subcontractor to submit to an audit by Owner as set forth in Section 9.8.6.

## **ARTICLE 6 - WORK BY OWNER OR BY SEPARATE CONTRACTORS**

### **6.1 OWNER'S RIGHT TO PERFORM WORK AND AWARD SEPARATE CONTRACTS**

- 6.1.1** Owner reserves the right to perform work related to the Project with Owner's own forces or a separate contractor, and to award separate contracts in connection with other portions of the Project or other work on the Job Site under these or similar General Conditions.
- 6.1.2** Contractor shall provide for the coordination of the Work with the work of any separate contractor of Owner and shall further cooperate with any separate contractor as provided in Paragraph 6.2.
- 6.1.3** In the alternative, Owner may, in its sole discretion, assign its obligations under any separate contract it has entered into with a third party to Contractor, and Contractor agrees to accept and comply with such obligations of such separate contract as if it were a Subcontract under these Contract Documents.

### **6.2 MUTUAL RESPONSIBILITY**

- 6.2.1** Contractor shall afford Owner and separate contractors reasonable opportunity for the introduction and storage of their materials and equipment and the execution of their work, and shall connect and coordinate his Work with theirs as required by the Contract Documents.
- 6.2.2** If any part of the Work depends on proper execution, or results upon the work of Owner or any other separate contractor, Contractor shall, prior to proceeding with the Work, promptly report to the Home Depot Project Manager any apparent discrepancies or defects in such other work that render it unsuitable for such proper execution and results. Failure of Contractor to report such discrepancies or defects shall constitute an acceptance of Owner's or separate contractor's work as fit and proper to receive his Work, except as to defects which are not then apparent but which may subsequently become apparent in such work by others.
- 6.2.3** Any costs caused by defective or ill-timed work shall be borne by the party responsible therefor.
- 6.2.4** Should Contractor cause damage to the work or property of Owner which is not subject to any separate contract, Contractor shall promptly remedy such damages as provided in Subparagraph 10.2.5.
- 6.2.5** Should Contractor wrongfully cause damage to the work or property of any separate contractor, Contractor shall upon due notice promptly attempt to settle with such other contractor by agreement, or otherwise to resolve the dispute. If such separate contractor sues or initiates an arbitration proceeding against Owner on account of any

damage alleged to have been caused by Contractor, Owner shall notify Contractor who shall defend Owner in such proceedings at Contractor's expense, and if any judgment or award against Owner arises therefrom, Contractor shall pay or satisfy it in accordance with Paragraph 4.17 above. The provisions of this Section 6.2.5 shall survive the expiration, completion or earlier termination of this Contract.

- 6.2.6** Owner shall not be liable to Contractor for any adjustments to the Project Schedule, damages, costs, losses or expenses, including but not limited to attorneys' fees, resulting from acts or omissions (whether or not negligent), failure to perform, delays in performance, or defaults of any separate contractor or any supplier in connection with the performance of any of the Work. Any claim of Contractor for such adjustments to the Project Schedule, damages, costs, losses or expenses shall be made, and any action by Contractor shall be filed directly against such other contractor or supplier without making Owner a party to any such claim or action. Contractor agrees that separate contractors or suppliers on the Project shall have a direct right of action against Contractor for damages, losses or expenses claimed to result from acts or omissions (whether or not negligent), failure to perform, delays in performance, or defaults of Contractor. To the extent that Contractor is or may be liable for any claims asserted by separate contractors or third parties against Owner in a trial or an arbitration proceeding, then, at the election of Owner, Contractor hereby consents to joinder in such trial or arbitration proceeding and to the direct assertion of claims by such contractor or third party against Contractor by demand to be consolidated into that single proceeding.

### **6.3 OWNER'S RIGHT TO CLEAN UP**

- 6.3.1** If a dispute arises between Contractor and separate contractors as to their responsibility for cleaning up as required by Paragraph 4.14, Owner may clean up and charge the cost thereof to Contractors responsible therefor as the Home Depot Project Manager shall determine.

## **ARTICLE 7 - MISCELLANEOUS PROVISIONS**

### **7.1 GOVERNING LAW & FORUM SELECTION**

- 7.1.1** The law of the State of Georgia shall govern and control the Contract Documents, all performance and any disputes thereunder or relating thereto, and any civil action in furtherance thereof shall be brought exclusively in either the U.S. District Court for the Northern District of Georgia, Atlanta Division, or the Superior Court of Cobb County, Georgia.

## **7.2 SUCCESSORS AND ASSIGNS**

- 7.2.1** Owner and Contractor each binds himself, his partners, successors, assigns and legal representatives to the other party hereto and to the partners, successors, assigns and legal representatives of such party in respect to all covenants, agreements and obligations contained in the Contract Documents. Contractor shall not assign the Contract or any portion thereof without the prior written consent of Owner, nor shall Contractor assign or grant a security interest in any moneys due or to become due to him hereunder, without the previous written consent of Owner.

## **7.3 WRITTEN NOTICE**

- 7.3.1** Written notice shall be deemed to have been duly served if delivered in person to the individual or member of the firm or entity or to an officer of the corporation for whom it was intended, or if sent by (a) a reputable overnight courier which keeps receipts of deliveries (such as UPS or Federal Express) or (b) through the facilities of the United States Post Office, postage prepaid, registered or certified mail, return receipt requested, to the last business address known to him who gives the notice. Notwithstanding the foregoing, if the Project is administered using Expesite, notices may be sent via a Project Notification in Expesite in lieu of sending such notice via courier service or mail

## **7.4 INJURY OR DAMAGE TO PERSON OR PROPERTY**

- 7.4.1** Should Contractor suffer injury or damage to person or property because of an act or omission of Owner, or others for whose acts Owner is legally liable, written notice of such injury or damage shall be given to Owner within a reasonable time not exceeding ten days after the first observance of such injury or damage. All claims for additional cost or time shall be in accordance with the other provisions of these General Conditions.

## **7.5 PERFORMANCE BOND AND LABOR AND MATERIAL PAYMENT BOND**

- 7.5.1** Owner shall have the right, prior to the execution of the Contract, to require Contractor to furnish bonds covering the faithful performance of the Contract and the payment of all obligations arising thereunder. If such bonds are required, they shall be written in the form of a Performance Bond and Labor and Material Payment Bond, which forms shall be appropriate for bonds for construction projects in the State where the Project is located, and acceptable to Owner. The Performance Bond shall be in an amount equal to One Hundred Percent (100%) of the full amount of the Contract Sum as security for the faithful performance of the Contract Documents, and the Labor and Material Payment Bond shall be in an amount equal to One Hundred Percent (100%) of the full amount of the Contract Sum as security for the payment of all persons performing labor and furnishing materials in connection with the Contract Documents. If there is an increase in the Contract Sum and/or an increase or change in the scope of



work authorized by Change Order or otherwise, then such Performance Bond and Labor and Material Payment Bond shall be increased or modified to reflect such change or addition to the Contract Sum or the scope of Work to ensure that bonds adequately cover the faithful performance of the Contract and the payment of all obligations arising thereunder.

- 7.5.2** The bonds shall be written with such sureties as may be acceptable to Owner. In addition, the sureties shall be authorized to conduct surety business in the state in which the Project is located, and the sureties and any reinsuring companies shall be listed in the current Department of the Treasury Circular No. 570 with an underwriting limitation equal to or greater than the penal sum of the bonds to be furnished.
- 7.5.3** Contractor shall require the Attorney-in-Fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of his power of attorney.

## **7.6 RIGHTS AND REMEDIES**

- 7.6.1** The duties and obligations imposed by the Contract Documents and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by law.
- 7.6.2** No action or failure to act by Owner or its representatives shall constitute a waiver of any right or duty afforded Owner under the Contract, nor shall any such action or failure to act constitute an approval of or acquiescence in any breach thereunder, except as may be specifically agreed in writing. The invalidity of any part or provision of the Contract Documents shall not impair or affect in any manner whatsoever the validity, enforceability or effect of the remainder of the Contract Documents.
- 7.6.3** Contractor shall check all materials, equipment and labor incorporated into the Work and shall keep such full and detailed accounts as may be necessary for proper financial management under this Contract. The system shall be satisfactory to Owner. Owner shall be afforded access to all Contractor's/Subcontractor's records, books, correspondence, instructions, drawings, receipts, vouchers, memorandums and similar data relating to the Work for audit or other purposes for such period as the records are required to be maintained herein. Notwithstanding any other provisions contained herein, the Contract Sum shall not be modified pursuant to the provisions of this paragraph. Contractor shall preserve all such records for a period of three years or for such longer period as may be required by law, after the final payment.

## **7.7 TESTS**

- 7.7.1** If the Contract Documents or Legal Requirements require any portion of the Work to be inspected, tested, or approved, Contractor shall give the Home Depot Project Manager timely notice of its readiness so the Home Depot Project Manager or



Architect may observe such inspection, testing, or approval. Contractor shall bear all costs of such inspections, tests, or approvals conducted by Governmental Authorities. Except as otherwise provided, Owner may engage an independent testing agency and, if so, shall bear all costs of such inspections, tests, and approvals.

- (1) Where proof of compliance with requirements of the Contract Documents by other documents or tests such as manufacturer's certificates, manufacturer's and fabricator's tests, independent laboratory tests and inspections, and other data is required by the Contract Documents before materials, products or equipment may be used in the Work, Contractor shall bear all costs for such certificates, tests, inspections, and other data.
  - (2) Where preliminary tests and inspections for design purposes, such as concrete mix designs, are required by the Contract Documents, Owner shall bear all costs for such tests and inspections.
  - (3) Where initial test or inspection reveals a failure of the Work to comply with requirements of the Contract Documents, Contractor shall bear all costs of additional tests and inspections necessary to determine compliance, including compensation for Architect's additional services made necessary by such failure.
- 7.7.2** If the Home Depot Project Manager determines that any Work requires special inspection, testing, or approval which Subparagraph 7.7.1 does not include, he will order such special inspection, testing, or approval, and Contractor shall give notice as provided in Subparagraph 7.7.1. If such special inspection or testing reveals a failure of the Work to comply with requirements of the Contract Documents, Contractor shall pay all costs thereof, including compensation for Architect's additional services made necessary by such failure; otherwise Owner shall bear such costs, and an appropriate Change Order shall be issued.
- 7.7.3** Reports of tests, inspections, and approvals performed by the independent testing agency engaged by Owner will be submitted to Owner, Architect, and Contractor directly from the testing agency. Unless made a part of the Contract Documents, such information is provided to Contractor for his information only. Contractor shall not rely upon such information, and the provision of such information shall not operate to excuse Contractor from any requirement of the Contract Documents. All other required certificates of inspection, testing, or approval shall be secured by Contractor and promptly delivered by him to the Home Depot Project Manager.
- 7.7.4** Contractor shall make all arrangements, furnish all samples and materials to be tested, and perform all related work necessary for the inspections, tests, and approvals of the Work required to be paid by Contractor under Subparagraphs 7.7.1 and 7.7.2.
- 7.7.5** Owner, with full cooperation from Contractor, will make all arrangements, furnish all samples and materials to be tested, and perform all related work necessary for the

inspections, tests, and approvals of the Work required to be paid by Owner under Subparagraphs 7.7.1 and 7.7.2.

## **7.8 DISPUTE RESOLUTION**

**7.8.1** All claims, disputes and other matters in question between Contractor and Owner arising out of, or relating to, the Contract Documents or the breach thereof, may, at the sole option of Owner, be decided by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association (“AAA”) then in effect. This provision shall be specifically enforceable in any court of competent jurisdiction. Nothing in this Article 7 shall be deemed to require Owner to subject disputes under the Contract Documents to arbitration.

**7.8.2** As a condition precedent to the institution of any action (lawsuit, arbitration, etc.) hereunder, all disputes shall be submitted to mediation before a professional mediator selected by the parties. Such mediations shall be conducted at a mutually agreed time and place, shall not be less than one day in length, and the costs and expenses of the mediator shall be split equally between the parties. At either party’s option, third parties may be joined in the mediation by consolidation, joinder or otherwise, if those parties are subject to a valid mediation agreement in connection with the Project; provided, however, a third party's refusal to participate in mediation does not eliminate Contractor's obligations to mediate disputes pursuant to this Paragraph 7.8. Only upon the unsuccessful completion of such mediations shall either party have the right to pursue further resolution of outstanding issues hereunder.

**7.8.3** When Owner has opted for arbitration, the following will apply:

- (1) Arbitration arising out of or relating to this Agreement may include, by consolidation, joinder or any other manner, any other persons substantially involved in a common question of fact or law, whose presence is required if complete relief is to be accorded in the arbitration. Consolidation shall be decided by an arbitrator in accordance with AAA rules. The arbitrator(s) shall decide procedural and substantive issues regarding arbitrability and whether conditions precedent have been satisfied.
- (2) Notice of demand for arbitration shall be filed in writing with the other party to this Agreement and with the American Arbitration Association Regional Office of Atlanta, Georgia. The demand shall be made within a reasonable time after the claim, dispute or other matter in question has arisen. In no event shall the demand for arbitration be made after the date when the applicable statute of limitations would bar institution of a legal or equitable proceeding based on such claim, dispute or other matter in question.
- (3) The award rendered by arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court of competent jurisdiction.

- (4) Unless otherwise agreed in writing, Contractor shall continue the Work and maintain its progress during any arbitration proceedings, and Owner shall continue to make payments not in dispute to Contractor in accordance with this Contract.
  - (5) The Federal Arbitration Act shall apply and govern disputes submitted to arbitration.
  - (6) If the amount in controversy is in excess of \$250,000, then the matter shall be decided by a panel of three arbitrators selected in accordance with the applicable rules of the AAA. All other matters shall be decided by a single arbitrator. If it becomes apparent that the amount in controversy exceeds \$250,000 after the selection of a single arbitrator, the AAA shall either add two more arbitrators to the panel or select a new panel of three arbitrators, whichever it deems more appropriate and efficient under the circumstances.
- 7.8.4** If Owner has not opted for arbitration as provided in Paragraph 7.8.1, claims, disputes, and other matters in question between the parties arising out of or relating to this Agreement shall be resolved in accordance with Sections 7.1.1 and 7.8.2 above.
- 7.8.5** This Section 7.8 shall survive the expiration, completion or earlier termination of this Contract. Unless otherwise agreed in writing, Contractor shall continue the Work and shall maintain the Project Schedule during any and all disputes, including but not limited to mediation, trial, or as applicable, arbitration proceedings, and Owner shall continue to make payments not in dispute to Contractor in accordance with this Contract.

## **7.9 COMMENCEMENT OF STATUTORY LIMITATION PERIOD**

### **7.9.1 As between Owner and Contractor:**

- (1) **Before Substantial Completion.** As to acts or failures to act occurring prior to Substantial Completion, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have occurred in any and all events on the date of Substantial Completion, or in the case of latent defects, the date of discovery by Owner if later;
- (2) **Between Substantial Completion and Final Certificate for Payment.** As to acts or failures to act occurring subsequent to Substantial Completion and prior to issuance of the final certificate for payment, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have occurred on the date of issuance of the final certificate for payment, or in the case of latent defects, the date of discovery by Owner if later; and
- (3) **After Final Certificate for Payment.** As to acts or failures to act occurring after issuance of the final certificate for payment, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued in

any and all events on the date of any act or failure to act by Contractor pursuant to any warranty provided under Paragraph 4.5, the date of any correction of the Work or failure to correct the Work by Contractor under Paragraph 13.2, or the date of discovery by Owner of latent defects, whichever occurs last.

## **7.10 USE OR OCCUPANCY PRIOR TO SUBSTANTIAL COMPLETION**

**7.10.1** Owner shall have the right to install his furnishings and equipment within the Project prior to Substantial Completion of the Work. Such installation shall not constitute occupancy, acceptance, or use by Owner.

**7.10.2** Owner shall have the right to use or occupy the Project, or a portion thereof, prior to Substantial Completion of the Work under the following conditions:

- (1) Owner shall give Contractor at least ten days prior written notice of Owner's intention to use or occupy the Project, or a portion thereof. Prior to use or occupancy, the Home Depot Project Manager accompanied by Contractor will conduct an inspection of the area to be used or occupied; and based on this inspection, the Home Depot Project Manager will prepare a list of Work to be completed or corrected. Prior to use or occupancy, Owner and Contractor shall agree in writing on their individual responsibilities for security, maintenance, heat, utilities, damage to the Work, and insurance for the area to be used or occupied.
- (2) The insurance company or companies providing the property insurance required by Paragraph 11.2 shall consent to the use or occupancy by endorsement prior to such use or occupancy.
- (3) After occupancy, Owner will allow Contractor reasonable access to the occupied area to complete and correct the Work.
- (4) Any claims for an adjustment in the Contract Sum or an extension of the Contract Time because of Owner's use or occupancy shall be made in writing to the Home Depot Project Manager prior to such use or occupancy.
- (5) Contractor shall not be held responsible for any damage to the occupied part of the Project resulting from Owner's use or occupancy.
- (6) Use or occupancy by Owner shall not be deemed to constitute a waiver of existing claims on behalf of Owner or Contractor against each other.

**7.10.3** If Contractor has not fully complied with all obligations of Paragraph 9.7, then the early use or occupancy by Owner shall not be deemed as Substantial Completion having occurred.

## **7.11 CONFIDENTIALITY**

**7.11.1** Contractor acknowledges that certain of Owner's valuable, confidential and proprietary information may come into Contractor's possession. Accordingly, Contractor agrees to hold all information it obtains from or about Owner in strictest confidence, not to use such information other than for the performance of the Work, and to cause any of its employees, Subcontractors or consultants to whom such information is transmitted to be bound to the same obligation of confidentiality to which Contractor is bound. Contractor shall not communicate Owner's information in any form to any third party without Owner's prior written consent. In the event of any violation of this provision, Owner shall be entitled to preliminary and permanent injunctive relief as well as an equitable accounting of all profits or benefits arising out of such violation, which remedy shall be in addition to any other rights or remedies to which Owner may be entitled. The provisions of this Section 7.11 shall survive the expiration or earlier termination of this Contract.

## **7.12 SURVIVAL OF PROVISIONS**

**7.12.1** All terms, conditions, representations and covenants contained herein which by their terms survive the expiration, completion or earlier termination of the Contract shall so survive the expiration, completion or earlier termination hereof.

## **7.13 ETHICS POLICY**

**7.13.1** Contractor agrees that it has received and reviewed Owner's *Home Depot Ethics Policy*. Contractor states further that Contractor and its Subcontractors, employees, officers, directors, agents, and representatives shall adhere strictly to the ethical principles set forth in Owner's *Home Depot Ethics Policy* to the same extent as if Contractor and its Subcontractors, employees, officers, directors, agents, and representatives were associates of Owner.

# **ARTICLE 8 - TIME**

## **8.1 DEFINITIONS**

**8.1.1** Unless otherwise provided, the Contract Time is the period of time allotted in the Contract Documents for full and final completion of the Work including authorized adjustments thereto. To the extent applicable, full and final completion must occur no later than the Grand Opening Date of the Home Depot store or facility which is the subject of the Project, or such later date as may be specified by the Home Depot Project Manager in writing.

**8.1.2** The date of commencement of the Work ("Commencement Date") is the date established in the Agreement, a notice to proceed, or such other date as may be

established by Owner in writing. Until a notice to proceed is issued by Owner, Owner shall have no liability to Contractor or any Subcontractor or material provider of Contractor resulting from Owner's decision to proceed or not proceed with the Work. The Commencement Date shall not be changed by the effective date of bonds or insurance.

- 8.1.3** The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically designated.

## **8.2 PROGRESS AND COMPLETION**

- 8.2.1** All time limits stated in the Contract Documents are of the essence of the Contract. By executing this Agreement, Contractor confirms that the Contract Time, being the time commencing with the execution of this Contract and ending with full and final completion of all Work, is a reasonable period for performing the Work.
- 8.2.2** Contractor shall begin the Work on the Commencement Date as defined in Subparagraph 8.1.2. Contractor shall not knowingly, except by agreement or instruction of Owner in writing, prematurely commence operations on the Job Site or elsewhere prior to the effective date of bonds, if any, insurance required by Article 7.5 and Article 11, respectively, to be furnished by Contractor, and compliance with all storm water pollution prevention requirements as set forth in the Contract Documents, including, but not limited to, Subparagraph 10.4.2 herein.
- 8.2.3** Contractor shall have forty-eight hours after the Commencement Date to advise Owner as to any reason or circumstance which would materially prevent Contractor from commencing and diligently pursuing its obligations as set forth in the Contract Documents. Contractor's failure to respond as set forth herein shall be deemed to be a waiver of any circumstance which would materially affect Contractor's ability to commence the work and proceed diligently with construction. Contractor agrees to use its good faith efforts to pursue all permits and other requirements related to the Work expeditiously.
- 8.2.4** Contractor shall carry the Work forward expeditiously with adequate forces and shall achieve completion of all elements of the Work within the Contract Time. Contractor shall schedule and perform his Work in accordance with the Project Schedule established jointly with Owner as provided in Paragraph 4.9. Contractor is responsible for all costs associated with maintaining and meeting the approved Project Schedule, unless otherwise expressly stated herein.

## **8.3 DELAYS AND EXTENSIONS OF TIME**

- 8.3.1** If a critical activity on the most recent, approved Project Schedule is delayed at any time in the progress of the Work by any act or neglect of Owner or Architect, or by any employee of either, or by any separate contractor employed by Owner, or by changes

ordered in the Work, fire, unusually severe adverse weather conditions or by any other cause which Owner determines may justify the delay, then the Contract Time may be extended by Change Order for such reasonable time as the Home Depot Project Manager may determine.

- 8.3.2** Any claim for delay involving compensation of any type, including but not limited to an extension of time, shall be made in writing to the Home Depot Project Manager not more than ten (10) days after commencement of the delay; otherwise the claim shall be waived. Contractor shall immediately take all steps reasonably possible to lessen the adverse impact of such delay on Owner. In the case of a continuing delay only one claim is necessary. Contractor shall provide an estimate of the probable effect of such delay on the progress of the Work as a part of Contractor's notice of the delay to Owner.
- 8.3.3** If no agreement is made stating the dates upon which interpretations as provided in Subparagraph 2.2.6 shall be furnished, then no claim for delay shall be allowed on account of failure to furnish such interpretations until fifteen days after written request is made for them, and not then unless such claim is reasonable.
- 8.3.4** This Paragraph 8.3 does not exclude the recovery by Owner of damages for delay.

## **8.4 REASONS FOR DELAY**

- 8.4.1** Contractor shall be responsible for damages incurred by Owner and any separate contractors for delay resulting from Contractor's failure to complete the Work within the Contract Time or resulting from the progress of the Work failing to conform to the Project Schedule. Contractor agrees that if overtime or additional workers or materials are necessary to meet the Contract Time, that such overtime will be performed or additional workers or materials will be procured by Contractor, and the additional expense thereof shall be borne by Contractor unless the delay requiring overtime shall have been occasioned directly by Owner, in which event Contractor shall be entitled to compensation for such overtime work or additional workers or materials in accordance with the Contract Documents.

## **ARTICLE 9 - PAYMENTS AND COMPLETION**

### **9.1 CONTRACT SUM**

- 9.1.1** The Contract Sum is provided in the Agreement and, including authorized adjustments thereto, is the total amount payable by Owner to Contractor for the performance of the Work under the Contract Documents.
- 9.1.2** Notwithstanding anything to the contrary contained in the Contract Documents, Owner may withhold up to 150% of any payment to Contractor under the Contract



Documents in addition to retainage if and for so long as Contractor fails to perform any of its obligations under the Contract Documents or otherwise is in default under any of the Contract Documents; provided, however, that any such holdback shall be limited to any amount sufficient in the reasonable opinion of Owner to cure any such default or failure of performance by Contractor.

- 9.1.3** In the case of a contract containing a guaranteed maximum price, all cost savings accrue to Owner.

## **9.2 SCHEDULE OF VALUES**

- 9.2.1** Contractor shall furnish Owner with a breakdown of the Contract Sum, divided into separate, detailed line-items of cost, including quantities of materials or related groups of costs organized by trade categories, which breakdown shall be in detail and in form and substance satisfactory to Owner (the "Schedule of Values"). Contractor shall submit two copies of the Schedule of Values to Owner for approval within ten (10) days of the date of the fully executed Contract, letter of intent, or notice to proceed, whichever is earliest. The Schedule of Values shall be submitted on Owner's form "Continuation Sheet," a copy of which is included in the Project Manual and is attached to the Agreement as **Exhibit D**. Contractor shall submit such data as required to substantiate the correctness of the Schedule of Values. Figures shall be rounded to the nearest ten dollars. The total of all values on the Schedule of Values shall equal the Contract Sum.

## **9.3 APPLICATIONS FOR PAYMENT**

- 9.3.1** Prior to the date each progress payment application is submitted, Contractor shall submit to the Home Depot Project Manager a rough draft of the itemized Application for Payment, supported by such data substantiating Contractor's right to payment as Owner may require, and reflecting retainage, if any. The Application for Payment shall be made on Owner's certificate for payment form and Owner's continuation sheet, substantially in the form attached to the Agreement as **Exhibit E**, and shall contain the same items and sequences as the Schedule of Values. Two (2) notarized copies of the Application for Payment must be submitted. Such Application for Payment shall be certified as correct by Contractor and shall be accompanied by waivers of liens and other documentation from Subcontractors and Sub-subcontractors as reasonably may be required by Owner and Owner's lender, if any, under its loan agreement with Owner, or title insurer. In addition, such Application for Payment shall contain a certification by Contractor that there are no claims or written claims of mechanics' or materialmen's liens submitted to Contractor at the date of such Application for Payment, that Contractor has no knowledge of any claims or of any filed or pending mechanics' or materialmen's liens with respect to the Work, that all due and payable bills with respect to the Work have been paid to date or shall be paid from the proceeds of such Application for Payment, that there is no known basis for the assertion of claims or filing of any mechanics' or materialmen's liens on the Work,



and that waivers from all Subcontractors constitute an effective waiver of claims and liens under the laws of the jurisdiction in which the Project is located to the extent of payments that have been made or are to be made concurrently with payment pursuant to such Application for Payment. Upon request by Owner, copies of all Applications for Payment shall be submitted by Contractor directly to Owner's lender for the Project.

- 9.3.2** Unless otherwise provided in the Contract Documents, payments will be made on account of materials or equipment not incorporated in the Work but delivered and suitably stored at the Job Site and, if approved in advance by Owner, payments may similarly be made for materials or equipment suitably stored at some other location agreed upon in writing. Payments for materials or equipment stored on or off the Job Site shall be conditioned upon submission by Contractor of bills of sale or such other procedures satisfactory to Owner to establish Owner's title to such materials or equipment or otherwise protect Owner's interest, including applicable insurance and transportation to the Job Site for those materials and equipment stored off the Job Site. Although title to these materials passes upon payment for same by Owner, Contractor agrees to be fully responsible for and to maintain and protect all materials, and repair or replace same if damaged, lost or stolen, until such materials are fully incorporated into the Project, and thereafter as set forth in the Contract Documents. Payment for materials off-site shall not constitute advance payment and will not deprive Owner of any claim, right or remedy under Contractor's bond or against Contractor.
- 9.3.3** Contractor warrants that title to all Work, including materials and equipment covered by an Application for Payment, whether incorporated in the Project or not, will pass to Owner upon delivery of same to the Job Site by Contractor, free and clear of all liens, claims, security interests or encumbrances, hereinafter referred to in this Article 9 as "liens." Contractor also warrants that no Work, materials or equipment covered by an Application for Payment will have been acquired by Contractor, or by any other person performing Work at the Job Site or furnishing materials and equipment for the Project, subject to an agreement under which an interest therein or an encumbrance thereon is retained by the seller or otherwise imposed by Contractor or such other person.
- 9.3.4** Contractor shall submit his release of claim and lien waiver covering prior Applications for Payment and his conditional release of claim and lien waiver covering the current Application with each Application for Payment on the form attached to the Agreement as **Exhibit E**. Also, Contractor shall ensure that all Subcontractors and material suppliers shall submit their releases of claim and lien waivers covering prior Applications for Payment through Contractor commencing with the second and each subsequent Application for Payment.
- 9.3.5** If at any time during the course of the Project Owner, because of notice from suppliers or Subcontractors or otherwise, becomes concerned with Contractor's financial ability to perform the Work or with the status of payments from Contractor to Subcontractors

or materialmen for the Project, Contractor, at Owner's request, shall provide adequate assurance and sufficient evidence that all outstanding obligations of Contractor in regard to material or labor furnished for this Project have been paid in full in accordance with previous Applications for Payment, or as required by the subcontracts or material supply contracts in question. Contractor agrees that should Owner request such information, providing information satisfactory to Owner in this regard is a condition of receipt of payment under the then pending Application for Payment.

- 9.3.6** Should at any time during the course of construction or after completion of the Work, a claim be made or a lien filed against Owner, or the property of Owner, or Project in question by any Subcontractor, Sub-subcontractor, supplier, laborer, or materialmen of Contractor or any or its Subcontractors, claiming that funds are owed to that party by Contractor or Owner as a result of work performed or material supplied to this Project or otherwise, Contractor hereby agrees immediately to defend and hold harmless Owner, Owner's landlord if any, Owner's lender if any, and Owner's developer if any, from all such claims, demands, or liens, and take all actions necessary to defend and otherwise protect Owner and its property from such claims and liens, including but not limited to the immediate removal of any liens from title to the property by securing said liens with a cash deposit, property bond, commercial surety bond or other method acceptable to Owner. The costs of any such lien removal or defense of claims made against Owner or its property shall be at the expense of Contractor, including all costs of any such bond, or legal fees, accounting fees or other expenses associated with defense of these claims. In addition, in the event a claim is made or a lien is filed against the Project by a Subcontractor, Sub-subcontractor or supplier and such claim or lien is not released or bonded within twenty (20) days after demand by Owner to Contractor, Owner, without obligation to do so and without prejudice to any other remedy Owner may have under the Contract Documents, may make payment directly and pay only the balance of the amount represented on the Application for Payment to Contractor after deducting the amounts paid and receive a credit against the Contract Sum for the amounts so paid.

## **9.4 OWNER REVIEW OF APPLICATIONS FOR PAYMENT**

- 9.4.1** The Home Depot Project Manager, within thirty (30) days after receipt of Contractor's Application for Payment, shall either approve the Application for Payment for such amount as the Home Depot Project Manager determines is properly due or notify Contractor of his reasons for withholding his approval as provided in Subparagraph 9.6.1. A copy of the approved Application for Payment shall be given to Contractor.

## **9.5 PROGRESS PAYMENTS**

- 9.5.1** Owner will make payment to Contractor within thirty (30) days after receipt of a proper Application for Payment, including, without limitation, all releases, claim and lien waivers in the form required by Owner, in the amount approved by the Home

Depot Project Manager, less any retainage and any amounts otherwise authorized to be withheld under the Contract Documents.

- 9.5.2** Contractor shall promptly pay each Subcontractor, in accordance with any outstanding Application for Payment, all amounts to which said Subcontractor is entitled, reflecting the percentage retained, if any, from payments to Contractor on account of such Subcontractor's Work. Contractor shall, by an appropriate agreement with each Subcontractor, require each Subcontractor to make payments to his Sub-subcontractors in similar manner. If through no fault of Owner, Contractor has not received payment in sufficient time to satisfy Subcontractor payment obligations, Contractor, at his expense, is to take whatever steps are required to keep the Job Site lien free at all times, including but not limited to, payment of Subcontractors and/or bonding of liens.
- 9.5.3** The Home Depot Project Manager may, on request and at his discretion, furnish to any Subcontractor, if practicable, information regarding the percentages of completion or the amounts applied for by Contractor and the action taken thereon by the Home Depot Project Manager on account of Work done by such Subcontractor.
- 9.5.4** Owner shall not have any obligation to pay or to see to the payment of any moneys to any Subcontractor except as may otherwise be required by law.
- 9.5.5** No certificate for a progress payment, nor any progress payment, nor any partial or entire use or occupancy of the Project by Owner, shall constitute an acceptance of any Work not in accordance with the Contract Documents.
- 9.5.6** Owner reserves the right, whenever it deems necessary, to pay Contractor by check payable jointly to Contractor and material supplier or Subcontractor, as the case may be, for any portion of the Application for Payment which is necessarily allocable to material suppliers or Subcontractors.
- 9.5.7** Owner will withhold from each progress payment to Contractor as retainage ten percent (10%) of amounts due Contractor under these General Conditions for completed portions of the Work, including materials and equipment delivered and suitably stored at the Job Site. Retainage shall equal no less than ten percent (10%) of the total Contract amount. Release or payment of retainage shall be made in accordance with these General Conditions.

## **9.6 PAYMENTS WITHHELD**

- 9.6.1** The Home Depot Project Manager (i) may decline to approve Contractor's Application for Payment in whole or in part, to the extent reasonably necessary to protect Owner and (ii) may nullify the whole or any part of any Application for Payment previously approved to such extent as may be necessary in the Home Depot Project Manager's opinion to protect Owner from loss because of:

- (1) defective Work not remedied,
- (2) third party claims asserted or filed or reasonable evidence indicating probable assertion or filing of such claims,
- (3) failure of Contractor to make payments properly to Subcontractors or for labor, materials, or equipment,
- (4) reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum,
- (5) damage to Owner, Owner's landlord, if any, or a separate contractor,
- (6) reasonable evidence that the Work will not be completed within the Contract Time,
- (7) failure to carry out the Work in accordance with the Contract Documents as determined by the Home Depot Project Manager,
- (8) failure to rectify previously discovered evidence or subsequent observations,
- (9) the withdrawal or threatened withdrawal of governmental permits or approvals,
- (10) Claims by Contractor, or
- (11) Contractor's failure to provide required documents or information.

**9.6.2** When the payment is withheld, the grounds for such withholding shall be provided to Contractor in the same timeframe as payments are required to be made. When the grounds for nonpayment are removed, payment shall be made for amounts withheld because of them. The provisions of Paragraph 9.6.1 shall not be deemed exclusive.

**9.6.3** Owner shall not be deemed to be in breach of this Contract by reason of the withholding of any payment pursuant to any provision of the Contract Documents provided the Work for which payment is being withheld shall have been rejected by any Governmental Authority, Owner or Owner's lender, if any.

## **9.7 SUBSTANTIAL COMPLETION**

**9.7.1** Substantial Completion shall mean completion of (i) any condition set forth by the Home Depot Project Manager and Architect, and (ii) all components of the Work such that a temporary certificate of occupancy to allow for the fixturing of the improvements and the stocking of inventory may be issued. The date of Substantial Completion of the Work or designated portion thereof is the date certified by the Home Depot Project Manager when construction is sufficiently complete, in accordance with the Contract Documents and when all required occupancy permits, if

any have been issued. Substantial Completion of the Work shall include, without limitation, the following:

- (1) Completion of paving and striping of all pavement and parking areas,
- (2) Completion of all electrical work (not including rack power and rack lighting),
- (3) Completion of all building mechanical systems,
- (4) Issuance of a temporary certificate of occupancy (sufficient to permit the store or facility which is the subject of the Project to open for business to the public) or an unqualified permanent certificate of occupancy by the appropriate Governmental Authorities,
- (5) Completion of the building fire protection systems and alarm systems,
- (6) The cleaning of the Job Site in accordance with these General Conditions,
- (7) Completion of the sanitary systems specified in the Contract Documents,
- (8) Completion of landscaping.

**9.7.2** When Contractor considers that the Work, or a designated portion thereof which is acceptable to Owner, is substantially complete as defined in Subparagraph 9.7.1, Contractor shall notify the Home Depot Project Manager and the Home Depot Project Manager with the assistance of Architect shall prepare for submission to Contractor a list of items to be completed or corrected, which list is referred to as a "punch list." The failure to include any items on such list does not alter the responsibility of Contractor to complete all Work in accordance with the Contract Documents. All Work on the punch list shall be promptly completed no later than the date of full and final completion, unless otherwise agreed in writing between Owner and Contractor. Warranties required by the Contract Documents shall commence on the Grand Opening Date of the store or facility which is the subject of the Project by Owner unless otherwise provided.

## **9.8 FINAL COMPLETION AND FINAL PAYMENT**

**9.8.1** Upon receipt of written notice from Contractor, including written acknowledgment by Architect or the Home Depot Project Manager that all punch list items have been completed and that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Home Depot Project Manager assisted by Architect will promptly make an inspection of the Work, and when the Home Depot Project Manager receives all warranties required by these Contract Documents and finds the Work acceptable under the Contract Documents and the Contract fully performed, the Home Depot Project Manager will promptly approve Contractor's final

Application for Payment. Contractor shall secure and deliver to Owner prior to, or concurrent with its application for final payment, written warranties and guarantees from its Subcontractors, Sub-subcontractors and suppliers bearing the date of final completion or some other date as may be agreed to by Owner and stating the period of warranty as required by the Contract Documents. Contractor is responsible for the warranty of all Work, whether performed by it or by its Subcontractors at any tier.

- 9.8.2** Neither the final payment nor the remaining retained percentage shall become due until Contractor submits to the Home Depot Project Manager (1) an affidavit that all payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which Owner or his property may in any way be subjected to liability have been paid or otherwise satisfied, (2) consent of surety, if any, to final payment, and (3) if required by Owner, other data establishing payment or satisfaction of all such obligations, such as receipts, releases and waivers of claims and liens arising out of or relating to the Contract, to the extent and in such form as may be designated by Owner. If any Subcontractor refuses to furnish a release or waiver required by Owner, Contractor shall furnish a bond satisfactory to Owner to indemnify him against any such claim or lien. If any such claim or lien remains unsatisfied prior to all payments having been made, Owner may withhold from final payment funds sufficient to satisfy the claim outstanding, including the reasonably anticipated cost of defense of same. Should a bond be posted, or if funds retained are insufficient, Contractor shall refund to Owner all moneys that the latter may be compelled to pay in discharging such claim or lien, including all costs and reasonable attorneys' fees.
- 9.8.3** If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of Contractor or by the issuance of Change Orders affecting final completion, Owner shall, upon application by Contractor, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance for Work not fully completed or corrected is less than the retainage stipulated in the Contract Documents, and if bonds have been furnished as provided in Paragraph 7.5, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by Contractor to the Home Depot Project Manager prior to certification of such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.
- 9.8.4** No payment, final or otherwise, shall operate to release Contractor or his sureties from any obligation under this Contract or the performance and payment bonds issued in accordance with this Contract.
- 9.8.5** The acceptance of final payment shall constitute a release to Owner and a waiver of all claims by Contractor.

- 9.8.6** Owner reserves the right to audit all Contractor and Subcontractor or other job-related documents and correspondence, including, without limitation, accounting records and construction documents, which audit may include, without limitation, a reconciliation of prior payments made under the Contract Documents. Contractor shall (i) promptly reimburse Owner for all amounts found due Owner as a result of Owner's audit, and (ii) pay Owner for all costs incurred by Owner to audit Contractor if the amount found due Owner as a result of the audit is greater than One Hundred Thousand Dollars (\$100,000) without regard to Contractor's response to the findings of the audit. In the event that prior payments are found to be inconsistent with the Contract Documents, said reimbursement shall be owed regardless of whether the reimbursement amounts were previously paid or approved by Owner. Amounts found due Contractor as a result of Owner's audit shall be deducted from any amounts owed Owner. All documents subject to audit shall be maintained by Contractor for a period of three years from Substantial Completion.

## **ARTICLE 10 - PROTECTION OF PERSONS AND PROPERTY**

### **10.1 SAFETY PRECAUTIONS AND PROGRAMS**

- 10.1.1** Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work.

### **10.2 SAFETY OF PERSONS AND PROPERTY**

- 10.2.1** Contractor shall take all reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage, injury or loss to:

- (1) all employees performing the Work and all other persons who may be affected thereby;
- (2) all the Work and all materials and equipment to be incorporated therein, whether in storage on or off the Job Site, under the care, custody or control of Contractor or any of his Subcontractors or Sub-subcontractors; and
- (3) other property at the Job Site or adjacent thereto, including building, improvements, trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

- 10.2.2** Contractor shall give all notices and comply with all applicable Legal Requirements of any Governmental Authority bearing on the safety of persons or property or their protection from damage, injury or loss.

- 10.2.3** Contractor shall erect and maintain, as required by existing conditions and progress of the Work, all reasonable safeguards for safety and protection, including posting danger



signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent utilities.

- 10.2.4** When the use or storage of explosives or other hazardous materials or equipment is necessary for the execution of the Work, Contractor shall exercise the utmost care and shall carry on such activities under the supervision of properly qualified personnel.
- 10.2.5** Contractor shall be responsible for and shall promptly remedy all damage or loss to any property referred to in Clauses 10.2.1(2) and 10.2.1(3) caused in whole or in part by Contractor, any Subcontractor, any Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable and for which Contractor is responsible under Clauses 10.2.1(2) and 10.2.1(3), except damage or loss solely attributable to the acts or omissions of Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to any fault or negligence of Contractor. The foregoing obligations of Contractor are in addition to his obligations under Paragraph 4.18.
- 10.2.6** Contractor shall designate a responsible member of his organization at the Job Site whose duty shall be the prevention of accidents. This person shall be designated with the approval of the Home Depot Project Manager.
- 10.2.7** Contractor shall not load or permit any part of the Work to be loaded so as to endanger its safety.
- 10.2.8** Contractor shall protect adjoining private or municipal property and shall provide barricades, temporary fences, and covered walkways required to protect the safety of passers-by, as required by prudent construction practices, Legal Requirements, or the Contract Documents.
- 10.2.9** Contractor shall secure the Work and materials and equipment to be incorporated thereon, whether in storage on or off-site, under the care, custody or control of Contractor or any Subcontractors, against theft or damage by anyone directly or indirectly employed by Contractor or anyone for whose acts Contractor may be liable, including those persons under the control of any Subcontractor.
- 10.2.10** In addition to its other obligations pursuant to this Article 10, Contractor shall, at its sole cost and expense, promptly repair any damage or disturbance to walls, utilities, sidewalks, curbs and the property of third parties (including municipalities) resulting from the performance of the Work, whether by it or by its Subcontractors at any tier. Contractor shall maintain streets in good repair and clean (free of debris, mud, snow, etc.) traversable condition.
- 10.2.11** To the extent otherwise permitted by applicable Legal Requirements, Owner shall have the right to require drug testing for any person employed by Contractor, by any



Subcontractor or by any Sub-subcontractor who is involved in an accident on the Job Site.

### **10.3 EMERGENCIES**

**10.3.1** From the date of the Agreement until final payment by Owner, the following shall be defined as an emergency:

- (1) Threats to safety of persons or property;
- (2) Threats from governmental agencies with control over the Work regarding the withdrawal of permits and/or licenses necessary for the proper execution, completion and/or occupation of the Work resulting from shoddy, incomplete or substandard construction techniques and materials; and
- (3) The sustaining of damage to portions of the Work resulting in financial hardship to Owner resulting from shoddy, incomplete or substandard construction techniques or materials.

**10.3.2** In any emergency affecting the safety of persons or property, Contractor shall act, at his discretion, to prevent threatened damage, injury or loss. Any additional compensation or extension of time claimed by Contractor on account of emergency work shall be determined as provided in Article 12 for Changes in the Work.

**10.3.3** If Contractor fails to respond to an emergency as defined in Section 10.3.1. above in a manner effectively to rectify the emergency or to commence and diligently pursue appropriate precautions to protect the Work within 24 hours after Contractor becomes aware of such condition or within 24 hours after written notice from Owner to Contractor, Owner may, without prejudice to other remedies Owner may have, commence and continue to perform such activities as necessary to relieve the emergency condition and all costs incurred by Owner pursuant thereto shall be an offset against the Contract Sum.

### **10.4 HAZARDOUS WASTES**

**10.4.1** Contractor shall, at its expense, comply (and have full responsibility for compliance) with all applicable environmental laws, regulations, rules and orders, regardless of when they become or became effective, including, without limitation, those relating to health, safety, noise, environmental protection, waste disposal, and water and air quality, and furnish satisfactory evidence of such compliance upon request of Owner or Owner's designated agent or contractor.

Should any hazardous or toxic waste, discharge, leakage, spillage, emission, asbestos, petrochemical contamination, pollution or environmental harm of any type occur upon or from the Project due to or resulting from the Work on the Project, Contractor, at its

expense, shall be obligated to clean and remediate the Project to the satisfaction of Owner and any Governmental Authority.

Contractor shall not bury any construction materials, paint, trash, equipment or other items on the Project. Contractor hereby represents and warrants that neither Contractor nor its Subcontractors or Sub-subcontractors will bury any construction materials, paint, trash, equipment or other items on the Job Site.

Should Owner learn or discover that any burial of construction materials, paint, trash, equipment or other items on the Project occurred during Contractor's performance of Work on the Project, Contractor, at its expense, shall be obligated to eliminate all such items in compliance with applicable Legal Requirements and restore the burial area to the condition required by the Contract Documents.

Should Contractor learn of the presence or suspected presence of any hazardous substance at the Job Site of any nature or resulting from any cause or source, Contractor shall immediately notify Owner in writing, and shall obtain Owner's written authorization to proceed prior to disturbing such condition or implementing any remediation, unless otherwise required by law.

Contractor agrees to indemnify, hold harmless and defend Owner against any and all liability, claims, damages, actions, costs and expense (including, without limitation, any fines, penalties, judgments, litigation costs and attorneys' fees) incurred by Owner as a result of Contractor's breach of this section as a result of any burial of construction materials, trash or equipment, or as a result of any hazardous or toxic waste, discharge, leakage, spillage, emission, asbestos, petrochemical contamination, pollution or environmental harm, including, without limitation, any violation of the Storm Water Requirements or breach of any obligation established under Section 02370 of the Specifications (or Exhibit SW: Storm Water Management Specifications (02370) as may be attached to and included in this Contract in the event that this Contract does not include Specifications with Section 02370), regardless of whether such liability, claims, damages, actions, costs or expense arise during or after the life of this Agreement, unless such liability, cost or expense is proximately caused by the sole negligence of Owner. The provisions of this Section 10.4.1 shall survive the expiration, completion or earlier termination of this Contract.

Contractor acknowledges and agrees that any hazardous materials or related construction debris removed from the Job Site shall be removed to a landfill that is permitted under the applicable provisions of the jurisdiction in which the landfill is located. No construction debris (hazardous or non-hazardous) shall be deposited in an landfill which is not fully permitted pursuant to applicable Legal Requirements and Storm Water Requirements. Contractor shall provide to Owner as part of its warranty/guarantee package copies of manifests identifying each and every landfill which received material from the Job Site, the amount and composition of material deposited at each respective landfill, and dates of manifests associated with each

landfill. Contractor acknowledges that final payment to Contractor may be withheld by Owner until such time as the documentation required herein is provided.

#### **10.4.2 STORM WATER POLLUTION PREVENTION**

Contractor acknowledges that Owner has selected Contractor to do the Work, in part, based on Contractor's represented skill, understanding and expertise in implementing and managing SWPPPs for the Project. Contractor represents and warrants to Owner that it understands the obligations imposed by the Storm Water Requirements and Section 02370 of the Specifications (or Exhibit SW: Storm Water Management Specifications (02370) as may be attached to and included in this Contract in the event that this Contract does not include Specifications with Section 02370), including without limitation the requirement to obtain and maintain a Storm Water Permit prior to the discharge of storm water associated with ground-disturbing construction activity. Contractor shall comply with the Storm Water Requirements and the terms of Section 02370 of the Specifications, and acknowledges that it is responsible for ensuring such compliance by all Subcontractors. ("SWPPP" and "Storm Water Requirements" shall have the meaning ascribed to them in Section 02370 of the Specifications (or Exhibit SW: Storm Water Management Specifications (02370)).

Notwithstanding anything to the contrary herein, Contractor shall defend, indemnify and hold harmless Owner, Owner's landlord or developer if any, and Architect, and their respective employees, officers and agents, against any resulting fines, penalties, judgments, liens, fees, damages, costs or expenses, including attorneys' fees (collectively "Losses") imposed on or incurred by the indemnified parties in this Paragraph, but only to the extent such Losses are not caused by Owner. The provisions of this Paragraph 10.4.2 shall survive the earlier termination, expiration or completion of the Contract.

### **ARTICLE 11 - INSURANCE**

#### **11.1 CONTRACTOR'S LIABILITY INSURANCE**

**11.1.1** Unless otherwise determined by Owner, Contractor shall purchase and maintain, from a company or companies licensed to do business in the state in which the Project is located, such insurance in accordance with Subparagraph 11.1.2 below. Such insurance shall protect Contractor from claims which may arise out of or result from the operations under the Contract, whether such operations arise through Contractor, any Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable. If Owner's lender, if any, or insurance carrier for the Project requires that the insurance requirements set forth in the Contract Documents be varied, Contractor agrees to enter into suitable

modifications of the provisions hereof, provided Owner bears any additional cost reasonably occasioned thereby.

**11.1.2** The insurance required by Subparagraph 11.1.1, if any, shall be written for not less than any limits of liability stated, or required by law whichever is greater, including contractual liability insurance as applicable to Contractor's obligations herein, and specifically endorsed to include coverage for the indemnity in Paragraph 4.17 or otherwise pursuant to this Contract. Such coverages shall be maintained by insurance carriers acceptable to Owner and Owner's lender, if any, in all respects, which carriers shall have an A.M. Best rating of not less than A- and a financial size rating of not less than VIII. All such policies of insurance shall name Owner, Architect, and Owner's lender, developer, and landlord if any, as an additional insured and copies of such contracts and certificates shall be provided to Owner. Contractor shall maintain the following insurance coverage and minimum limits of liability with amounts of all coverage indicated on the certificates which are to be filed in duplicate with Owner:

- (1) a. Worker's compensation with statutory limits.
- b. Employer's liability insurance in an amount not less than \$100,000 per occurrence, covering bodily injury by accident or disease, including death.
- (2) Commercial general liability: not less than \$3,000,000 per occurrence with an aggregate limit of not less than \$10,000,000. The insurance required shall be at least as broad as the most commonly available ISO Commercial General Liability policy form CG 00 01 12 04.
- (3) Automobile liability: Combined single limit of \$3,000,000 per occurrence or its equivalent.

**11.1.3** Contractor shall submit to Owner, for approval, before commencing the Work, evidence of the above required insurance. If Owner is damaged by the failure of Contractor to maintain insurance, Contractor shall bear all reasonable costs properly attributable thereto. Insurance as required is a material condition of this Contract. Failure to obtain insurance as required renders this Contract voidable at Owner's option. All insurance shall be occurrence based coverage.

**11.1.4** All certificates of insurance shall contain a provision that coverage afforded by the policies will not be canceled or allowed to expire until at least thirty (30) days prior written notice has been given to Owner.

## **11.2 PROPERTY INSURANCE**

**11.2.1** Unless otherwise provided, Owner will purchase and maintain property insurance upon the entire Work at the Job Site to the full insurable value thereof. This insurance shall include the interests of Owner, Architect, Contractor, Subcontractors, and Sub-

Subcontractors in the Work and shall insure against the perils included in a standard "Builder's Risk" policy. The policy deductible, (if any) will be assumed by Owner. Owner shall purchase and maintain similar property insurance on portions of the Work stored off the Job Site or in transit when such portions of the Work are to be included in an Application for Payment under Paragraph 9.3. Contractor shall immediately report any and all potential claims or property damage, in writing, to the Home Depot Project Manager.

**11.2.2** This insurance will not cover any tools owned by Contractor or mechanics, any tools, equipment, scaffolding, staging, towers, and forms owned or rented by Contractor, the capital value of which is not included in the Contract Sum, or structures erected for housing the workmen.

**11.2.3** Owner will furnish a Certificate of Insurance to Contractor upon request.

### **11.3 OWNER'S LIABILITY INSURANCE**

**11.3.1** Owner shall be responsible for purchasing and maintaining his own liability insurance and, at his option, may purchase and maintain such insurance as will protect him against claims which may arise from operations under the Contract. Nothing in this Subparagraph 11.3.1 shall limit or diminish Contractor's obligations or liability as otherwise provided in the Contract Documents.

## **ARTICLE 12 - CHANGES IN THE WORK**

### **12.1 CHANGE ORDERS**

**12.1.1** A Change Order is a written order to Contractor electronically approved by Owner via Expesite, issued after execution of the Contract, authorizing a change in the Work or an adjustment to the Contract Sum or the Contract Time. The Contract Sum and the Contract Time may be changed only by Change Order. A Change Order signed by Contractor indicates his agreement therewith, including the adjustment in the Contract Sum or the Contract Time.

**12.1.2** Owner, without invalidating the Contract, may order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and the Contract Time being adjusted accordingly. All such changes in the Work shall be authorized by Change Order in the form attached to the Agreement as **Exhibit E** and shall be performed under the applicable provisions of the Contract Documents.

**12.1.3** The cost or credit to Owner resulting from a change in the Work shall be determined in one or more of the following ways:

- (1) by mutual acceptance of a sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- (2) by unit prices stated in the Contract Documents or subsequently agreed upon;
- (3) by costs to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee;
- (4) by costs contained in the Contractor's proposal submitted in response to an RFP through Exposite that has been approved by Owner; or
- (5) by the method provided in Subparagraph 12.1.5.

**12.1.4** All Change Orders initially submitted to Owner for authorization with an estimated price shall be revised to reflect Contractor's actual cost prior to submission to Owner of the final Application for Payment.

**12.1.5** If none of the methods set forth in Clauses 12.1.3(1), 12.1.3(2), 12.1.3(3), or 12.1.3(4) is agreed upon, Contractor, provided he receives a written order signed by Owner, shall promptly proceed with the Work involved. The cost of such Work shall then be determined by Owner on the basis of the reasonable expenditures and savings of those performing the Work attributable to the change, including, in the case of an increase in the Contract Sum, a reasonable allowance for overhead and profit. In such case, and also under Clauses 12.1.3(3) and 12.1.3(5) above, Contractor shall keep and present, in such form as Owner may prescribe, an itemized accounting together with appropriate supporting data for inclusion in a Change Order. Pending final determination of cost to Owner, payments shall be made on Owner's certificate for payment. The amount of credit to be allowed by Contractor to Owner for any deletion or change which results in a net decrease in the Contract Sum will be the amount of the actual net cost determined by Architect or the Home Depot Project Manager plus overhead and profit. When additions and/or credits covering related Work or substitutions are involved in any one change, the allowance for overhead and profit shall be figured on the basis of the net cost, whether deductive or additive with respect to that change. The cost of a change determined under the methods in clauses 12.1.3(1), 12.1.3(3), 12.1.3(4), and 12.1.3(5) shall include all costs directly related to the change, and Contractor shall itemize these costs and provide appropriate supporting data as may be necessary to establish correctness. All indirect costs whether incurred on or off the Job Site shall be included in Contractor's overhead. Such indirect costs include, without limitation, insurance, taxes, bonds, salaries of Contractor's personnel unless the Work is performed with Contractor's own forces, local travel, and expenses of Contractor's principal and branch offices.

**12.1.6** If unit prices are stated in the Contract Documents or subsequently agreed upon, and if the quantities originally contemplated are so changed in a proposed Change Order

because application of the agreed unit prices to the quantities of Work proposed will cause substantial inequity to Owner or Contractor, the applicable unit prices may be equitably adjusted.

- 12.1.7** In the case of Work authorized under clauses 12.1.3(1) and 12.1.3(3), when applicable and accepted by Owner, a reasonable allowance for overhead and profit shall be the percentage fees proposed by Contractor and approved by Owner. Notwithstanding the foregoing, total markups for changes made pursuant to this Article 12, shall be limited to the amounts specified in Article 4 of the Agreement.
- 12.1.8** Notwithstanding anything to the contrary herein, Owner's approval of Contractor's proposal submitted in response to an RFP through Exesite shall not constitute a Change Order. If Owner's notification to Contractor through Exesite of Owner's approval of Contractor's responsive proposal includes a specific direction to Contractor to proceed with the work contained in Contractor's proposal, then Contractor shall proceed with the work as directed and promptly process a request for a Change Order for the work. If a Project is administered by Exesite and Owner and Contractor execute a Change Order that changes the Contract Sum, the final adjusted Contract Sum shall be reflected in the contract summary tab in Exesite and not on the Change Order form.

## **12.2 CONCEALED AND UNKNOWN CONDITIONS**

- 12.2.1** Should Contractor encounter conditions which are both concealed and unknown either below the surface of the ground or in an existing structure, and said conditions are of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in this Contract, then subject to the conditions set forth in Paragraph 12.2.2 hereof, the Contract Sum may be equitably adjusted by Change Order upon claim by either party made within ten (10) days after the first observance of the conditions.
- 12.2.2** Notwithstanding anything to the contrary in Paragraph 12.2.1 hereof, Contractor shall promptly, and before such conditions are disturbed, notify Owner in writing of the physical conditions at the Job Site which are both concealed and unknown, and which are of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in the work of the character provided for in this Contract. The Home Depot Project Manager shall promptly investigate the conditions, and if he finds that such conditions do constitute conditions that are both concealed and unknown (as described in the immediately preceding sentence) and cause an increase or decrease in Contractor's cost of, or the time required for, performance of any part of the Work under this Contract, whether or not changed as a result of such conditions, an equitable adjustment may be made and the Contract modified in writing accordingly. If Contractor proceeds with work resulting from or affecting a concealed and unknown condition prior to written notice to Owner, the Home Depot Project



Manager's inspection, or receipt of a written directive of how to proceed, then Contractor waives any and all claims relating to the concealed or differing condition.

No claim of Contractor under this paragraph or under Paragraph 12.2.1 shall be allowed unless Contractor has given the notice required in this Paragraph 12.2.2; provided, however, the time prescribed therefor may be extended by Owner.

Notwithstanding anything to the contrary in this Contract, no claim by Contractor for an equitable adjustment hereunder in the Contract Sum shall be allowed if asserted after the final Application for Payment under this Contract has been submitted by Contractor to Owner.

### **12.3 AS-BUILTS**

**12.3.1** Contractor shall receive from Architect a complete set of reproducible prints of the Drawings, and shall note in red on this set any deviations of installation or construction in a manner satisfactory to Architect.

**12.3.2** Record Drawings shall be submitted to Architect by Contractor as soon as possible after completion of the Work and before request for final payment.

**12.3.3** Record Drawings shall include the following additional drawings of as-built conditions:

- (1) For any new building, a drawing to show location of building as built on property and said location to be certified by registered surveyor.
- (2) Drawings of any underground lines, tanks, etc. and shall indicate on these drawings both graphically and dimensionally the locations, identification and size of such lines, tanks, etc.

### **12.4 CONSTRUCTION WORK DIRECTIVE**

**12.4.1** Owner also may direct a change in the Work prior to any agreement on adjustment, if any, to the Contract Sum or Contract Time, by issuing a unilateral written directive ("Construction Work Directive"). The Construction Work Directive shall be in the form attached to the Agreement as **Exhibit C**. Except with respect to an approved proposal in response to an RFP pursuant to the immediately following sentence, a Construction Work Directive shall be used when Owner and Contractor have not yet agreed to the final adjustments, if any, to the Contract Sum or Contract Time on account of a change in the Work. Notwithstanding the foregoing, a Construction Work Directive that references an approved proposal in response to an RFP shall be evidence of Owner's and Contractor's agreement on an adjustment to the Contract Sum or Contract Time, if any, as indicated in the approved proposal.



- 12.4.2** Contractor shall diligently prosecute the Work described in the Construction Work Directive. A Construction Work Directive shall state the changes in the Work to be performed, and, if known, the estimated cost of the change in the Work, if any, a description of how the cost, if any, of the changed Work was calculated, and any impact on the Contract Time based on information provided by Contractor.
- 12.4.3** Upon receipt of a Construction Work Directive, Contractor shall promptly proceed with the change in the Work involved and advise Owner of Contractor's agreement or disagreement with the method, if any, provided in the Construction Work Directive for determining a proposed adjustment, if any, in the Contract Sum or Contract Time.
- 12.4.4** The parties shall negotiate diligently in good faith and as expeditiously as possible if either party believes that the Construction Work Directive requires a Change Order.

### **ARTICLE 13 - CORRECTION OF WORK AND WARRANTIES**

#### **13.1 UNCOVERING OF WORK**

- 13.1.1** If any portion of the Work should be covered contrary to the request of the Home Depot Project Manager or to requirements specifically expressed in the Contract Documents, the covered Work shall, if required in writing by the Home Depot Project Manager, or by any Governmental Authority, be uncovered for the Home Depot Project Manager's observation and shall be replaced at Contractor's expense, without a change in the Contract Time or the Contract Sum.
- 13.1.2** If any other portion of the Work has been covered which the Home Depot Project Manager has not specifically requested to observe prior to being covered, the Home Depot Project Manager, or any Governmental Authority, may request to see such Work and it shall be uncovered by Contractor. If such Work is found to be in accordance with the Contract Documents, the cost of uncovering and replacement shall, by appropriate Change Order, be charged to Owner. If such Work is found not to be in accordance with the Contract Documents, Contractor shall pay such costs unless it is found that this condition is the responsibility of others as provided for in Article 6.

#### **13.2 CORRECTION OF WORK**

- 13.2.1** Contractor shall promptly correct all Work rejected by the Home Depot Project Manager as defective or as failing to conform to the Contract Documents whether observed before or after Substantial Completion and whether or not fabricated, installed or completed. Contractor shall bear all costs of correcting such rejected

Work including compensation for Architect's additional services made necessary thereby.

- 13.2.2** If, within one year after the Grand Opening Date of the store or facility which is the subject of the Project by Owner or within one year after acceptance by Owner (which ever shall be the last to occur) or within such longer period of time as may be prescribed by law or by the terms of any applicable special warranty required by the Contract Documents, or as may be provided by a particular product manufacturer or supplier, any of the Work is found to be defective or not in accordance with the Contract Documents, Contractor shall, at its sole cost and expense, take all steps necessary to promptly and completely correct said Work to Owner's satisfaction and in conformance with the Contract Documents. Contractor acknowledges that warranty or correction service requests may be called directly to Contractor from Owner's maintenance/property management department. Contractor shall immediately take all steps necessary to correct the Work, including but not limited to contacting the appropriate Subcontractor or other entity, and shall respond back to Owner within twenty four (24) hours after Owner contacted Contractor. If corrective actions are not commenced within twenty-four (24) hours of notification or completed within thirty (30) days of notification, Owner may take all actions necessary to correct the Work, and Contractor shall promptly pay Owner upon demand, all amounts expended by Owner for such corrective action. This obligation shall survive termination of the Contract. Furthermore, Contractor agrees to repair at its sole cost any Work which Contractor may affect or disturb in making the repair herein contemplated.
- 13.2.3** Contractor shall remove from the Job Site all portions of the Work which are defective or non-conforming and which have not been corrected under Subparagraphs 4.5.1, 13.2.1 and 13.2.2, unless removal is waived by the Home Depot Project Manager.
- 13.2.4** If Contractor fails to correct defective or non-conforming Work as provided in Subparagraphs 4.5.1, 13.2.1 and 13.2.2, Owner may correct it in accordance with Paragraph 3.4.
- 13.2.5** If Contractor does not proceed with the correction of such defective or nonconforming Work within a reasonable time fixed by written notice from the Home Depot Project Manager, Owner may remove it and may store the materials or equipment at the expense of Contractor. If Contractor does not pay the cost of such removal and storage within ten days thereafter, Owner may upon ten additional days written notice to Contractor sell such Work at auction or at private sale and shall account for the net proceeds thereof, after deducting all the costs that should have been borne by Contractor. If such proceeds of sale do not cover all costs which Contractor should have borne, the difference shall be charged to Contractor and an appropriate Change Order shall be issued. If the payments then or thereafter due Contractor are not sufficient to cover such amount, Contractor shall pay the difference to Owner.

**13.2.6** Contractor shall bear the cost of making good all work of Owner or separate contractors destroyed or damaged by such correction or removal.

**13.2.7** Nothing contained in this Paragraph 13.2 shall be construed to establish a period of limitation with respect to any other obligation which Contractor might have under the Contract Documents, including Paragraph 4.5 hereof. The establishment of the time period of one year after the date of Grand Opening or acceptance by Owner, as applicable (pursuant to Section 13.2.2), or such longer period of time as may be prescribed by law or by the terms of any warranty required by the Contract Documents relates only to the specific obligation of Contractor to correct the Work, and has no relationship to the time within which his obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish Contractor's liability with respect to his obligations other than specifically to correct the Work. The provisions of Section 13.2 shall survive the expiration, completion or earlier termination of the Contract.

### **13.3 ACCEPTANCE OF DEFECTIVE OR NON-CONFORMING WORK**

**13.3.1** If Owner prefers to accept defective or non-conforming Work, he may do so instead of requiring its removal and correction, in which case a Change Order will be issued to effect such conditions upon which Owner's acceptance of the defective or non-conforming Work is predicated, including, but not limited to, a reduction in the Contract Sum, the extension of warranties, and/or additional remedial work. Such adjustments shall be effected whether or not final payment has been made.

## **ARTICLE 14 - TERMINATION OF THE CONTRACT**

### **14.1 TERMINATION BY CONTRACTOR**

**14.1.1** If the Work is stopped for a period of thirty (30) days under an order of any court or other public authority having jurisdiction, or as a result of an act of any Governmental Authority, such as a declaration of a national emergency making materials unavailable, through no act or fault of Contractor or a Subcontractor or their agents or employees or any other persons performing any of the Work under a contract with Contractor, Contractor may upon thirty (30) additional days written notice to Owner, terminate the Contract and recover from Owner payment for all Work executed and for any proven loss sustained upon materials, equipment, tools, construction equipment and machinery, including reasonable overhead and profit and damages as provided in Article 12.

## **14.2 TERMINATION BY OWNER**

**14.2.1** Owner may elect, at Owner's sole option, either to terminate Contractor's employment as Contractor under the Contract or to terminate the Contract by written notice to Contractor under any of the following circumstances: (a) in Owner's discretion at any time in whole or in part, without cause, upon giving Contractor not less than seven (7) days' written notice; or (b) if Contractor makes a general assignment for the benefit of its creditors, is unable to pay its debts as they become due, becomes the subject of any voluntary or involuntary bankruptcy, insolvency, arrangement, reorganization or other debtor-relief proceeding under any law, state or federal, now in existence or hereafter becoming effective, or any amendment thereto or commits any other act of bankruptcy under applicable bankruptcy law; or (c) if Contractor refuses or fails or is unable for any reason to supply enough properly skilled workmen or proper materials to perform or complete the Work, or if Contractor fails or is unable for any reason other than failure of Owner to make payments to Contractor in accordance with this Contract to make prompt payment to Subcontractors or suppliers and vendors for materials or labor, or if Contractor disregards Legal Requirements bearing on performance of the Work of which Contractor is aware or of which a reasonably prudent contractor having the skill and expertise of Contractor should have been aware, or disregards the instructions of Owner, developer (if made pursuant to Owner's directions) or Owner's consultants (if made pursuant to Owner's directions), or otherwise is in default of any provision of the Contract Documents or has failed to remedy same within ten (10) working days after receipt of written notice thereof. It is expressly understood and agreed, however, that the termination of the employment of Contractor pursuant to this Subparagraph 14.2.1 shall not, unless Owner expressly states in writing, constitute a termination of the Contract, nor of Contractor's obligations thereunder, nor of the obligations of Contractor's surety, nor of the obligations of any surety under any Subcontractor bond, nor the obligations of Contractor to Owner hereunder.

**14.2.2** Upon a termination of the Contract or Contractor's employment by Owner pursuant to Subparagraph 14.2.1, Owner shall be immediately released from any and all obligations to Contractor hereunder, Contractor shall immediately discontinue the Work, Owner shall be entitled to take possession of the Project, the Job Site, all warranties and guaranties provided with respect to the Project, all or any part of the materials delivered or on route to the Project and which are included in the Contract Sum and all materials, equipment, tools and construction equipment and machinery on the Job Site owned by Contractor, and Owner shall have the right to finish the Work by whatever reasonable method Owner deems expedient. If requested by Owner, Contractor will make every reasonable effort to cancel any existing orders, subcontracts, and contracts specified by Owner upon terms satisfactory to Owner. Contractor shall also, upon request by Owner, deliver and assign to Owner (but in no event shall Owner be liable for any actions or defaults of Contractor occurring prior to such delivery and assignment), any and all contracts, subcontracts, Subcontractor bonds, purchase orders, and options made by Contractor in performance of the Work, and deliver to Owner true and correct originals and all copies of the Contract

Documents, and of all other materials relating to the Work which belongs to Owner, together with all papers and documents relating to governmental permits, orders placed, bills and invoices, lien releases and financial management under the Contract, for the purpose of fully vesting in Owner the rights and benefits of Contractor under this Contract and the Subcontracts. Notwithstanding any termination of Contractor's employment or the Contract pursuant to this Article 14 and provided Owner takes actual possession of the Project within a reasonable time after termination, Contractor shall take such steps as are reasonably necessary to preserve and protect Work completed and in progress and to protect materials, supplies, plant and equipment at the Job Site or in transit. No action taken by Owner after the termination of Contractor's employment or the Contract shall prejudice any other rights or remedies of Owner provided by law, by the Contract Documents, or otherwise upon such termination.

- 14.2.3** If Contractor's employment or the Contract is terminated pursuant to Subparagraph 14.2.1(a), Contractor shall be paid for the following: (i) the cost for all Work performed by Contractor or its Subcontractors in accordance with the Contract Documents less all amounts previously paid to Contractor for Work performed by Contractor or its Subcontractors to the date of termination, (ii) all reasonable costs incurred by Contractor at Owner's request after termination, (iii) all materials delivered to the Job Site or off-site locations approved in accordance with this Contract if paid for by Contractor and not otherwise paid for by Owner pursuant to clause (i) above, (iv) reasonable and necessary costs incurred by Contractor in terminating subcontracts, provided Owner has not requested that such subcontracts be assigned to Owner, (v) a proportionate part of the unpaid balance of Contractor's Fee or profit, if any, payable by reason of Work having been performed by Contractor or its Subcontractors in accordance with the Contract Documents based on the percentage of the Work completed at the date of termination, and (vi) as to materials, supplies and equipment (not covered by (i) through (iv) above) ordered for the Project but not delivered to the Job Site, (x) the cost of such materials, supplies and equipment provided the same are delivered and turned over to Owner and further provided Contractor has paid for such materials, supplies and equipment, or (y) the sum of any penalty or charge payable by Contractor upon cancellation of the order if Contractor has not paid for such materials, supplies and equipment provided Owner has not requested Contractor to assign to Owner its rights to such order. All payments to be made to Contractor pursuant to this Subparagraph 14.2.3 shall be made within thirty (30) days after receipt and approval by Owner of a final Application for Payment accompanied by a sworn statement from Contractor setting forth a full and detailed account of the Contract Sum performed to date of termination of employment or the Contract, with appropriate supporting invoices, bills and other materials satisfactory to Owner, and such statement shall also include the balance of any earned fees computed as provided above. Under no circumstances shall Contractor be paid any profit on work performed if Contractor would have lost money on the Project had it completed the Project. Owner shall also be permitted to deduct from amounts otherwise due to

Contractor based on the percentage loss Contractor would have suffered had it completed the Project.

- 14.2.4** If Contractor's employment or the Contract is terminated by Owner pursuant to (b) or (c) of Subparagraph 14.2.1, Owner, within a reasonable period of time after the Work is finally complete, shall determine the total cost to Owner for completing the Work, including but not limited to compensation for Owner's consultants, developer's and Owner's other consultants' services and expenses made necessary thereby and all sums previously paid or then owed to Contractor pursuant to this Contract. If the Contract Sum exceeds the cost to finally complete the Project, Contractor shall be paid an amount equal to such excess plus all amounts described in (i) through (iii) of Subparagraph 14.2.3 above minus the amount of all damages suffered by Owner due to default or breach by Contractor in the performance of its obligations under the Contract Documents. If the Contract Sum is less than the cost to complete the Work, Contractor shall pay to Owner on demand the amount of such difference plus all damages incurred by Owner as a result of the reason giving rise to the termination by Owner, minus the amount of all sums described in (i) through (iii) of Subparagraph 14.2.3 above. All payments, if any, to be made to Contractor pursuant to this Subparagraph 14.2.4 shall be made within thirty (30) days after Owner has determined the total Contract Sum in accordance with this Subparagraph 14.2.4.

## **ARTICLE 15 - MINORITY AND WOMEN BUSINESS ENTERPRISES**

- 15.1.1** It is Owner's policy that minority and women business enterprises be provided practicable opportunities to participate in the performance of Owner's construction contracts. Such participation is anticipated to be as contractor, subcontractor, or supplier to contractors performing work or rendering services on Owner's projects. Owner does not require the utilization of minority or women business enterprises in the performance of its construction contracts, nor does it establish goals for such involvement, but it encourages all participants in its projects at all levels to consider the use and involvement of minority and women business enterprises.

The Soils Report is made available for the convenience of the Contractor.

Data on the indicated subsurface conditions are not intended as representations or warranties of accuracy or continuity between soil borings.

It is expressly understood that Owner will not be responsible for interpretations or conclusions drawn therefore by Contractor. Contractor may make additional test borings and other exploratory operations for the purpose of preparing his bid but these will be at no cost to Owner.

# GEOTECHNICAL ENGINEERING REPORT



## **THE HOME DEPOT**

(NWQ) FL Turnpike & SR 836  
Doral, FL

## **PREPARED FOR: HOME DEPOT**

2455 Paces Ferry Road  
Atlanta, GA 30339

NOVA Project Number: 10101-2017021.000

November 20, 2017



PROFESSIONAL | PRACTICAL | PROVEN





November 20, 2017

**HOME DEPOT**

2455 Paces Ferry Road  
Atlanta, GA 30339

**Attention:** Mr. Alan Williams Jr.

**Subject:** Geotechnical Engineering Report  
HOME DEPOT  
Fl. Turnpike & SR 836  
Doral, FL  
NOVA Project Number 10101-2016016

Dear Mr. Williams:

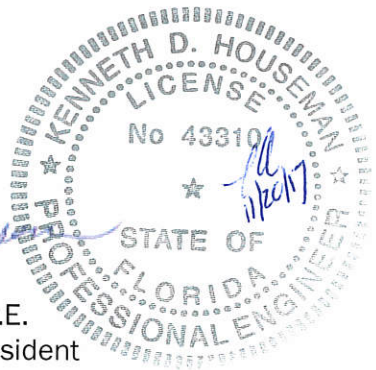
**NOVA Engineering and Environmental, LLC (NOVA)** has completed the authorized Geotechnical Engineering Report for the Beacon Lakes, **HOME DEPOT** site, located in Doral, Florida. This report briefly discusses our understanding of the project at the time of the subsurface exploration, describes the geotechnical consulting services provided by NOVA, and presents our findings, conclusions, and recommendations. The work was performed in general accordance with NOVA Proposal Number 001-30166352, dated March 31, 2017 (revised September 12, 2017), and the Professional Service Agreement and signed by HOME DEPOT and Nova Engineering & Environmental, LLC on October 10, 2017.

We appreciate your selection of NOVA and the opportunity to be of service on this project. If you have any questions, or if we may be of further assistance, please do not hesitate to contact us.

Sincerely,  
**NOVA Engineering and Environmental, LLC**

Brendan Larkin, P.E.  
Project Engineer  
Florida Registration No. 60145

Ken Houseman, P.E.  
Executive Vice President



## EXECUTIVE SUMMARY

The following information is provided as a brief summary of details contained in the attached report. The report should be read in its entirety prior to the implementation into design and construction.

1. NOVA performed a geotechnical investigation at the site in accordance with NOVA Proposal No. 001-30166352 (revised September 12, 2017), authorized through a Consulting Agreement signed on October 10, 2017. A total of 140 soil test borings extending to depths ranging from 10 to 25 feet below the existing ground surface (bgs) were performed at the site.
2. The project site is located at the northwest quadrant (NWQ) of the Florida Turnpike and State Road 836 in Doral Florida. The site occupies approximately 9.71 acres. The site is currently undeveloped and portions of the site was classified as wetlands. The site has been recently cleared and there is currently muck and standing water on the surface of the site. It is our understanding that the current property owner is to provide a prepared pad to a negotiated elevation, which we understand is still in discussion, and that de-mucking responsibilities are the current property owner's responsibility.
3. It is our understanding that the proposed Home Depot includes 116,620 square feet of building under roof with 28,118 square feet of Garden Center. Other site improvements include 395 parking spaces, loading docks and heavy-duty delivery areas.
4. Generally, the borings encountered organic soils up to 30 inches in depth followed by Sandy Oolitic Limestone extending to about 13 feet bgs, which is underlain by a Limestone formation to the maximum boring termination depth of 25 ft.
5. Groundwater was encountered at all the boring locations at depths ranging from the surface (standing surface water) to 6 feet below the existing ground surface (bgs) and the seasonal high-water table is estimated to be at the existing surface of current grades.
6. We recommend stripping and grubbing the proposed construction areas to remove all organic laden soil (muck), vegetation, root systems, construction debris, and other unsuitable materials from the site prior to placement of any structural fill material. The exposed subgrade should be proof-rolled to detect near surface unsuitable materials. Unstable materials identified during the proof-rolling should be undercut from the building and pavement areas. The proof-rolling should be performed both longitudinally and transversely using either a fully-loaded dump truck or a heavy vibratory roller. The top 12 inches of the exposed surface shall be compacted to a minimum soil density of at least 95 percent of the maximum dry density as determined by Modified Proctor test (ASTM D-1557). The building and pavement areas should be backfilled in 12 inch

loose lifts to the desired finished subgrade elevation with structural fill, with each lift compacted to a minimum soil density of at least 95 percent of the maximum dry density as determined by Modified Proctor test (ASTM D-1557).

Structural fill should consist of clean sands (SP) and/or crushed limestone. Fill materials should be free of topsoil, organics, deleterious materials, and rock fragments larger than 3 inches. The fill material should be placed in 12-inch loose lifts.

7. There is currently standing water at the site; therefore, groundwater will be encountered during excavations, dependent on the final grades established for the development and utility installation depths. Dewatering will be required to achieve the required compaction and to prevent seepage from entering the bottom and/or sides of the excavations. Groundwater is expected be satisfactorily controlled in shallow excavations at this site with a well point and/or sump pump system.
8. Subsequent to the site being prepared per the Geotechnical recommendations, the proposed structure may be supported on conventional shallow foundation systems bearing upon compacted structural fill and/or natural soils that are of suitable classification. Foundations may be designed for a maximum design soil bearing pressure of 3,000 pounds per square foot (psf), subsequent to the foundation bottom being compacted to meet a 95% minimum compaction requirement when correlated with the Modified Proctor Value of the soil.
9. NOVA recommends that the floor slab bearing soils be compacted to meet a minimum compaction requirement of 98% of a Modified Proctor value and that a vapor barrier be installed consisting of a lapped polyethylene membrane/sheeting (vapor barrier) of at least 6-mil thickness. The vapor barrier will reduce the potential for floor dampness which can affect the performance of adhered architectural finishes, if any are used.
10. We recommend using a flexible pavement system for the construction of the paved parking areas and access roadways. For standard duty traffic, a flexible pavement section consisting of 3 inches of asphaltic concrete underlain by a minimum of 6 inches of crushed concrete/limerock base is recommended. For heavy-duty traffic, a flexible pavement section consisting of 4 inches of asphaltic concrete underlain by a minimum of 8 inches of crushed concrete/limerock base is recommended. Subgrade soils and Base course material should be compacted to meet a minimum requirement of 98% of a Modified Proctor value, subgrade soils should meet a minimum LBR value of 40% and base course material should meet a minimum LBR value of 100%. All materials utilized in the pavement section should meet FDOT requirements, both in classification and installation procedures.
11. After the project criteria, foundation plans, grading plans, and utility plans are finalized, NOVA should be permitted to review the plans to establish whether the recommendations contained in this report are correctly incorporated into the plans and whether the recommendations need to be modified.

12. We recommend NOVA be retained to provide construction materials testing and inspection for the project during the construction. This will enhance the correct interpretation of our recommendations during the construction. Moreover, subsurface conditions encountered during the construction may differ from what encountered during the subsurface exploration. In this case, we could re-evaluate and, if necessary, modify our recommendations during the construction.

## TABLE OF CONTENTS

<b>1.0</b>	<b>PROJECT OVERVIEW .....</b>	<b>1</b>
1.1	INTRODUCTION.....	1
1.2	SITE AND PROJECT DESCRIPTION .....	1
1.3	PURPOSE AND SCOPE OF SERVICES.....	1
<b>2.0</b>	<b>EXPLORATION PROCEDURES .....</b>	<b>3</b>
2.1	SUBSURFACE EXPLORATION .....	3
2.2	LABORATORY TESTING.....	4
<b>3.0</b>	<b>SUBSURFACE CONDITIONS .....</b>	<b>4</b>
3.1	CURRENT SITE CONDITIONS.....	4
3.2	COUNTY SOIL SURVEY .....	5
3.3	REGIONAL GEOLOGY .....	5
3.4	SUBSURFACE CONDITIONS .....	5
3.5	GROUNDWATER OBSERVATIONS .....	6
3.6	GENERALIZED SOIL PROFILE .....	6
<b>4.0</b>	<b>CONCLUSIONS AND RECOMMENDATIONS .....</b>	<b>7</b>
4.1	GENERAL .....	7
4.2	FOUNDATIONS.....	8
4.3	EARTH PRESSURE ON WALLS.....	8
4.4	FLOOR SLAB DESIGN .....	9
4.5	EARTHWORK OPERATIONS.....	10
4.6	BORROW AND ON-SITE SOIL SUITABILITY .....	14
4.7	PAVEMENT CONSIDERATIONS.....	15
4.8	SEISMIC CONSIDERATIONS .....	16

## APPENDICES

- Appendix A – Figures
- Appendix B – Test Boring Records
- Appendix C – Qualifications of Recommendations

## **1.0 PROJECT OVERVIEW**

### **1.1 INTRODUCTION**

In accordance with your request and authorization, NOVA has completed a subsurface exploration and geotechnical engineering evaluation for the above referenced project. We explored the general subsurface conditions to evaluate their suitability for the support of the proposed construction, to obtain a measure of pertinent engineering properties of subsurface materials and to provide recommendations for site preparation and foundation design. Our work included 140 soil test borings (STB) and associated engineering analyses. This report describes our explorations and tests, reports our findings, and summarizes our conclusions and recommendations.

### **1.2 SITE AND PROJECT DESCRIPTION**

We have been provided with the following documents related to the project:

- An architectural site plan (FL-707m) prepared by Greenberg Farrow Architecture, Inc. (GFA) last revised in February 2017.

The project site is located at the at the northwest quadrant (NWQ) of the Florida Turnpike and State Road 836 in Doral Florida. The site occupies approximately 9.71 acres. The site is currently undeveloped and portions of the site was classified as wetlands. The site has been recently cleared and there is currently muck and standing water on the surface of the site, with clearing and de-mucking activities occurring as our drilling operations were being conducted.

According to the conceptual plans, proposed development includes the construction of a Home Depot with a footprint of 116,640 square feet of building under roof with 28,118 square feet of Garden Center. Other site improvements include 365 parking spaces, loading docks and heavy-duty delivery areas. Structural load data have not been provided to us at the time of this report.

### **1.3 PURPOSE AND SCOPE OF SERVICES**

The purpose of this study was to obtain information on the general subsurface conditions in the proposed development area at the subject site. The subsurface materials encountered were then evaluated with respect to the available project characteristics. In this regard, engineering assessments for the following items were formulated:

- Identification of major construction constraints that may hinder the proposed development.
- General location and description of potentially deleterious materials encountered in the borings which may interfere with the construction progress or structure performance, including existing fills, surficial/subsurface organics, and/or depth and extent of other unsuitable foundation-bearing materials.
- Evaluation of using a conventional shallow foundation system for support of the proposed building structure. Identification of recommended foundation design parameters.
- Recommendations for soil subgrade preparation operations, including stripping, grubbing and compaction. Recommended engineering criteria for placement and compaction of approved structural fill materials.
- Evaluation of the suitability and availability of materials on-site that may be moved during site grading for use as structural fill in the building area and as general backfill.
- Presentation of construction recommendations, including expected ground water control measures, temporary slope stability recommendations and unsuitable soil removal guidelines.

The following specific tasks were performed in the geotechnical exploration:

- Executed a program of subsurface exploration consisting of subsurface sampling and field testing. We performed a total of 140 soil test borings (STB) at the site including the following:
  - 43 Standard Penetration Test (SPT) borings, B-1 through B-43 drilled to depths of 10 feet below the ground surface (bgs) within the proposed parking areas.
  - 96 Standard Penetration Test (SPT) borings, B-46 through B-139 were drilled to depths of 20 to 25 feet bgs within the proposed building and garden center footprint areas.
  - One (1) SPT boring, B-140 drilled to approximately 20 feet bgs at the planned pylon sign location.

In each SPT boring, samples were collected and Standard Penetration Test resistances were measured at approximate intervals of two feet for the top ten feet and at approximate intervals of five feet thereafter. The borings were backfilled with cuttings and hole plug after completion of the drilling process. In the auger borings, as each soil type was encountered, its depth interval was recorded and representative samples



taken for review in the laboratory. The borings were backfilled with soil cuttings and/or hole plug after completion of the exploratory process.

- Visually classified and stratified representative soil samples in the laboratory using the Unified Soil Classification System.
- Collected ground water level measurements in the borings and estimated normal wet seasonal high ground water levels.
- Prepared this geotechnical report by a professional geotechnical engineer registered in the State of Florida. The report summarizes the field and laboratory services performed and provides an engineering analysis of the site soil and groundwater conditions with special attention to potential subsurface conditions that may hinder development. The report includes the following information:
  - Methodology and results of our field investigation;
  - Current water table and estimated seasonal high-water table;
  - Evaluation of the subsoil support characteristics for the proposed construction;
  - Recommendations on foundation design parameters and construction;
  - Recommendations for site preparation procedures;
  - Recommendations for pavement design;
  - Recommended soil properties for the design of retaining walls; and
  - Other pertinent geotechnical considerations.

The scope of this exploration did not include an evaluation of potential deep soil problems, such as sinkholes which are not a concern for this project location.

The scope of our services did not include any environmental assessment or investigation for the presence or absence of hazardous or toxic materials in the soil, ground water, or surface water within or beyond the site studied. Any statements in the report regarding odors, staining of soils, or other unusual conditions observed are strictly for the information of our client.

## **2.0 EXPLORATION PROCEDURES**

### **2.1 SUBSURFACE EXPLORATION**

To explore subsurface conditions at the site, 140 soil test borings (STB's) were performed to depths ranging from 10 to 25 feet (bgs). The approximate locations of the borings are shown on Figure 1 – Field Exploration Plan, presented in Appendix A. Our field exploration was conducted on October 14, 2017 through November 1, 2017.



The boring locations were laid out in the field by a representative from NOVA using a handheld Global Positioning Unit and a measuring wheel/tape based on structural features observed at the site.

The boring locations illustrated in the Appendix should be considered accurate only to the degree implied by the method used. If more precise locations are desired, we suggest that you contact a Registered Surveyor. It is important to note that ground surface elevations at the boring locations were neither furnished nor determined.

The Standard Penetration Test (SPT) borings were performed using the guidelines of ASTM Designation D-1586, "Penetration Test and Split-Barrel Sampling of Soils". A mud rotary drilling process was used to advance the borings. At regular intervals, the drilling tools were removed and soil samples were obtained with a standard 1.4-inch I.D., 2.0-inch O.D., split-tube sampler. The sampler was first seated six inches and then driven an additional foot with blows of a 140-pound hammer falling 30 inches. The number of hammer blows required to drive the sampler the final foot is designated the "Penetration Resistance". The penetration resistance, when properly interpreted, is an index to the soil strength and density. Representative portions of the soil samples, obtained from the sampler, were placed in glass jars and transported to our laboratory for further evaluation and laboratory testing.

## 2.2 LABORATORY TESTING

The field logs and recovered soil samples were transported to our soils laboratory from the project site. Each soil sample was then examined by a Geotechnical Engineer using the Unified Soil Classification System using the guidelines of American Society of Testing and Materials (ASTM) Test Designations D-2487 and D-2488. Due to the structural characteristics of the proposed facility and the nature of the soils encountered, NOVA did not perform any laboratory testing on the soils.

Corrosion parameter samples have been sent to an analytical lab for testing, and the results will be reported under a separate letter submittal.

## 3.0 SUBSURFACE CONDITIONS

### 3.1 CURRENT SITE CONDITIONS

A NOVA geotechnical engineer conducted a site reconnaissance during the exploration. At the time of the exploration, the site was currently undeveloped, but site clearing and de-mucking activities were in progress during our drilling operations. Topographic survey information provided by a review of the topographic map of the ArcGIS – South

*Miami Dade County Florida Topo*, indicated that the overall site previously ranged between El. 5 to El. 0 feet MSL.

### 3.2 COUNTY SOIL SURVEY

The “Soil Survey of Miami/Dade County, Florida”, published by the United States Department of Agriculture (USDA) Soil Conservation Service (SCS), was reviewed for general near-surface soil information within the general vicinity of the subject project. This information indicates that there is one primary soil-mapping unit, Biscayne marl-Rock outcrop complex (Soil Unit 25), within the proposed project area. The surface layer of marly silt loam is about 4 inches thick. The underlying layer is un-weathered bedrock, about 76 inches thick.

In its natural state, the high-water table in the Biscayne marl-Rock outcrop complex is less than 10 inches deep.

### 3.3 REGIONAL GEOLOGY

The site is located in the southern zone of the Atlantic Coastal Ridge. The geology is characterized by the near surface Miami Limestone formation which overlies the deeper Ft. Thompson Formation.

The Miami Limestone (formally the Miami Oolite), occurs at or near the surface in southeastern peninsular Florida from Palm Beach County to Miami-Dade and Monroe Counties. It forms the Atlantic Coastal Ridge and extends beneath the Everglades where it is commonly covered by thin organic and freshwater sediments.

The Miami Limestone consists of two (2) facies, an oolitic facies and a bryozoan facies. The oolitic facies consists of white to orange- gray, poorly to moderately indurated, sandy oolitic limestone with scattered concentrations of fossils. The bryozoan facies consist of white to orange-gray, poorly to moderately indurated, sandy fossiliferous limestone. Beds of quartz sand are also present as unindurated sediments and unindurated limey sandstone. Fossils present include mollusks, bryozoans and corals. Molds and casts of the fossils are common. The highly porous and permeable Miami Limestone forms much of the Biscayne Aquifer of the surficial aquifer system.

The vicinity of the Subject Property is generally developed with commercial warehouses.

### 3.4 SUBSURFACE CONDITIONS

Subsurface conditions within the project site were evaluated using 140 soil test borings (STB's) that were performed to depths ranging from 10 to 25 feet (bgs). The subsurface

conditions encountered at the boring locations are described on the Test Boring Records in Appendix B of this report.

These records represent our interpretation of the subsurface conditions based on the field logs and visual observations of samples by an engineer. The lines designating the interface between various strata on the Boring Records represent the approximate interface locations and elevation. The actual transition between strata may be gradual. Groundwater levels shown on the Boring Records represent the conditions only at the time of our exploration. It should be understood that soil and rock conditions may vary between boring locations.

Once penetrating the surficial topsoil and organics at the boring locations, the soil materials encountered in the soil borings are generally arranged in two (2) major layers. Each major soil unit is described briefly below. The shallower auger borings did not penetrate Soil Unit 2.

**Soil Unit 1 – Sandy Oolitic Limestone:** Below the organic mat surface, the soil borings encountered a layer of generally sandy limestone. The thickness of this unit extended from the surface to the depths of 13 feet in the structural areas of the site. Average SPT N values measured in this unit in the borings were between 3 and 51 blows per foot (bpf), averaging 20 bpf.

**Soil Unit 2 – Limestone:** Underneath Soil Unit 1, the soil test borings encountered a layer of limestone. Depths to the top surface of this unit averaged about 13 feet (bgs). SPT blow counts in this unit were typically 1 to 5 inches of penetration of the Split-spoon sampler into the formation for at least 50 blows per foot.

### 3.5 GROUNDWATER OBSERVATIONS

Across the site groundwater was observed at depths ranging from 0 feet to 6 feet (bgs). Fluctuations in groundwater level on this site should be anticipated throughout the year due to a variety of factors, the most important of which are recharge from rainfall. It is our estimate that the seasonal high groundwater table at the site is at approximately 0 to 1 foot (bgs).

### 3.6 GENERALIZED SOIL PROFILE

To facilitate discussion, a generalized soil profile is presented in the following table. The generalized soil profile represents the average conditions within the top 25 feet of the subsurface encountered in the soil test borings.

SOIL UNIT	MATERIAL DESCRIPTION	USCS	DEPTH TO TOP SURFACE (FT-BGS)	THICK. (FT)	SPT N VALUE (blow/ft)
1	Sandy Oolitic Limestone		0.0	13	20
3	Limestone		13	10	>100
Ground Surface Elevation (MSL NAVD88)			=	N/A	
Depth to Ground Water Table (ft-bgs)			=	0 – 6'	
Depth to Seasonal High Water Table (ft-bgs)			=	0 – 1'	

The above generalized subsurface profile should only be used for discussion purposes only. Please note that subsurface conditions are expected to vary across the site.

## 4.0 CONCLUSIONS AND RECOMMENDATIONS

### 4.1 GENERAL

Our understanding of the project is based on the project information provided to us. The development of the project site will include the construction of a new Home Depot facility and associated parking and access drives.

The following design recommendations have been developed based on the previously described project characteristics and subsurface conditions encountered during this exploration. The test boring data was evaluated utilizing correlations between the measured standard penetration test resistances and the engineering performance characteristics of similar subsurface conditions.

Subsurface conditions in unexplored locations or at other times may vary from those encountered at specific boring locations. If such variations are noted during construction, we request the opportunity to review the changes and amend our recommendations, if necessary

If there is any change in these project criteria, it is considered essential that a review be made by NOVA to determine if any modifications to the recommendations will be required.

After final design plans and specifications are available, a general review by NOVA is strongly recommended as a means to check that the evaluations made in preparation of this report are correct, and that earthwork and foundation recommendations are properly interpreted and implemented.

## 4.2 FOUNDATIONS

After the recommended site and subgrade preparation and fill placement, we recommend a conventional shallow foundation be used to support the proposed structure. The shallow foundations should be designed using a maximum allowable soil bearing pressure of 3,000 pounds per square foot (psf). **The aforementioned bearing pressure is based on the foundation bottoms being compacted to 95% of a Modified Proctor value to a minimum depth of 1 foot below the foundation bearing surface.** The foundations should bear on properly improved natural subgrade or on properly placed and compacted cohesion less (slightly silty sand) fill soils.

The exterior foundations should be embedded so that the bottom of the foundations are a minimum of 16 inches below the adjacent compacted grades on all sides to allow for proper confinement; interior foundations may be located at nominal depths below the floor slab elevations. It is also recommended that any continuous foundations be a minimum of 24 inches wide to provide adequate load bearing area to develop overall bearing capacity and account for minor variations in the bearing materials. Interior column foundations should be appropriately sized for the recommended 3,000 psf bearing pressure.

All footings should be constructed in a "dry" fashion. It is recommended that the building grades be selected so that normal seasonal high groundwater levels remain at least one foot below the footing bases. It is important that the structural elements be centered on the footings such so that loads are transferred evenly, unless the footings are adequately proportioned for eccentric loads.

Settlement of individual footings designed in accordance with the recommendations outlined above is expected to be less than 1 inch with differential settlements per 30 feet of wall footing expected to be on the order of 0.5 inches or less. These settlement estimates are based on our engineering experience with these soils and are provided to guide the structural design. Total and differential settlements of these magnitudes are usually considered tolerable for the anticipated construction; the tolerance of the proposed structure to the predicted total and differential settlements should be confirmed by the Structural Engineer.

## 4.3 EARTH PRESSURE ON WALLS

Earth retaining structures such as ramps and/or truck wells/docks may need to be constructed at the site. These retaining walls should be designed to resist pressures exerted by the adjacent soils. For walls that are not restrained during backfilling, and are free to rotate at the top, active earth pressures should be considered in their design.

Walls that are restrained should be designed using at-rest pressures. Recommended soil parameters for the “clean” granular soils are presented below:

Earth Pressure Type	Earth Pressure Coefficient	Equivalent Fluid Pressure (pcf)	
		Above Water Table	Below Water Table
Active ( $K_a$ )	0.33	35	80
At-Rest ( $K_o$ )	0.50	53	89
Passive ( $K_p$ )	3.00	150*	TBD**
Coefficient of Sliding Friction	0.35		

Notes:

- \* Wall movements required to develop full passive earth pressures are significantly greater than movements necessary for active earth pressure. Consequently, this passive earth pressure value has been reduced by at least 50% for wall design.
- \*\* Passive earth pressure for submerged walls shall be determined on a case-by-case basis.

Adequate drainage should be provided behind the walls to prevent the build-up of excess hydrostatic pressures. This can be achieved by installing drains, using geotextiles, or backfilling with free-draining sand, in association with adequate weep holes.

In order to reduce the loads being applied to the underground foundation walls and to promote positive water drainage, it is recommended that a granular backfill be placed directly behind the walls and extended laterally a minimum distance equal to the wall height. These granular soils should be relatively clean, free-draining granular materials containing less than five percent passing the No. 200 sieve (0.074 mm). These granular soils are locally available within the general project vicinity. Positive drainage of these backfill soils should also be provided by means such as "sock" enclosed perforated pipe toe drains.

Wall rotation may be reduced by tying the wall directly into the floor slab. It is also important to note that wall damage due to excessive compaction or vibration should be avoided by utilizing hand-operated mechanical tampers; heavy compaction equipment should not be allowed within 10 feet of the walls. The compaction behind these walls should be 95 percent of the Modified Proctor maximum dry density (ASTM D-1557).

## 4.4 FLOOR SLAB DESIGN

The slab on grade may be designed based on a subgrade modulus ( $K_1$ ) of 150 pci for the analysis of concrete slab thickness, provided that a 4-inch thick layer of compacted crushed stone is placed beneath the floor slab, which in turn is supported on structural fill compacted to density no less than 95% of Maximum Modified Proctor Dry Density. The design should include joint preparation in accordance with ACI recommended practices.

The value ( $K_1$ ) is for a unit footing dimension of 1 foot by 1 foot (for situations such as wheels of a forklift); for larger foundations, the  $k$ -value should be reduced in accordance with the following equation:

$$K = K_1 \left( \frac{B + 1}{2B} \right)^2$$

Where  $B$  is the foundation width in feet.

It should be noted that for a large foundation width  $B$  for situations such as areal loading for warehouses,  $K$  approaches  $K_1/4$  or approximately 38 pci for this case.

It is recommended that the floor slab bearing soils be covered by a lapped polyethylene sheeting of at least 6-mil thickness in order to reduce the potential for floor dampness which can affect the performance of glued tile and carpet, if any are used.

This membrane should consist of a 6-mil single layer of non-corroding, non-deteriorating polyethylene sheeting material placed so as to minimize seams and to cover all of the soil below the building floor slab. This membrane should be cut in a “cross shape” to allow for pipes or other penetrations and the membrane should extend to within ½ inch of all such pipes or penetrations. All seams of the membrane should be lapped at least 12 inches. Punctures or tears in the membrane should be repaired with the same or comparable material and sealed in a waterproof manner.

The performance of concrete floor slabs is also affected by the concrete mix that is used. A relatively high water-cement ratio of the concrete can cause aesthetic disruptions, such as unsightly slab “curling” and shrinkage cracking. Also, an additional waiting period may be required prior to installing moisture-sensitive floor covering because of the moisture loss from the concrete floor slab. In order to reduce slab “curling” it is suggested that the vapor barrier be covered with a 2-inch thick layer of “clean” sand or approved suitable granular material.

## 4.5 EARTHWORK OPERATIONS

### Subgrade Preparation

Prior to construction, the location of any existing underground utility lines within the construction area should be established. Provision should then be made to relocate interfering utility lines from the construction area to appropriate locations. In this regard, it should be noted that if underground pipes are not properly removed or plugged, they may serve as conduits for subsurface erosion, which subsequently may result in excessive settlements.



The site should be cleared before construction. This will primarily include stripping of existing muck, vegetation, root systems, and topsoil. If encountered, trash and other unsuitable materials should also be removed from the construction area. It is recommended a minimum stripping depth of 6 inches. The stripping within the proposed construction area should be extended at least 5 feet, where possible, beyond the planned construction limits.

After stripping to the desired grade and performing all necessary excavation and prior to fill placement, the exposed subgrade should then be proof-rolled using a fully-loaded double axle dump truck, or a heavy (10 - 12 tons) vibratory roller that is capable of exerting a minimum impact force of 36,000 pounds. Any soft, yielding soils detected during the proof-rolling operations should be excavated and replaced with approved fill conforming to the specifications below. Sufficient passes should be made during the proof-rolling operations to produce minimum dry densities of 95 percent of the Modified Proctor (ASTM D-1557) maximum dry density value of the compacted subgrade soils to depths of 1 foot below the compacted surface. The proof-rolled areas should receive no less than 8 overlapping passes, half of them in each of two perpendicular directions. Extreme caution should be used when operating the vibratory compactor near existing structures (within 75 feet) to avoid the transmission of vibration that could cause settlement damage, cracking or disturbance of occupants.

### **Fill Placement**

All fill to be placed on site should consist of clean, granular, inorganic sandy soils with less than 12 percent passing the US No. 200 sieve. Structural fill materials should be placed in lifts not exceeding 12 inches in loose thickness and should be compacted to at least 95 percent of the maximum dry density as determined by the Modified Proctor Test Method (ASTM D-1557).

Fill placed in non-structural areas (e.g. grassed areas) should be compacted to at least 90 percent of the maximum dry density according to ASTM D-1557, in order to avoid significant subsidence. The upper one foot of soils supporting slabs-on-grade and pavements should also be compacted to a minimum of 98 percent of the maximum dry density obtained in accordance with the ASTM Specification D-1557, Modified Proctor Method discussed above. Compliance tests should be performed at a rate of 1 test per 2,500 square feet per foot of improvement (depth) in the structural areas and 1 test per 5,000 square feet in paved areas.

If any problems are encountered during the earthwork operations, or if site conditions deviate from those encountered during our subsurface exploration, the Geotechnical Engineer should be notified immediately.



### **Groundwater Control**

Groundwater levels should be determined immediately prior to excavations and construction. Shallow groundwater should be kept at least one foot below the lowest working area to facilitate proper material placement and compaction. Depending upon groundwater levels at the time of construction, some form of dewatering may be required to achieve the required compaction and to prevent seepage from entering the bottom and/or sides of the excavations. Groundwater can normally be controlled in shallow excavations with a sump pump system.

Soils exposed in the bases of all satisfactory foundation excavations should be protected against any detrimental change in conditions, such as physical disturbance or rainwater. Surface runoff water should be drained away from the excavations and not be allowed to pond. If possible, all footing concrete should be placed the same day that the excavations are made. If this is not possible, the footing excavations should be adequately protected in the interim.

At the time of this subsurface exploration, groundwater table was encountered in the borings at depths ranging approximately 0 feet to 2 feet 4 inches (bgs). It is our estimate that the seasonal high groundwater table at the site is at approximately 0 feet 4 inches (bgs). Dewatering measures will be needed, such as sump and pump, for the project during construction, depending on finish design elevations, utility depths, and the time of construction.

### **Temporary Side-slopes**

All open-cut excavation areas should be properly dewatered for a period of at least 24 hours prior to the initiation of excavation operations. Following the proper dewatering operations, side slopes for temporary excavations may stand near 1½ horizontal to one (1) vertical (1½H:1V) for short dry periods of time to a maximum excavation depth of six feet. Where restrictions do not permit slopes to be constructed as recommended above, the excavation should be shored and braced in accordance with current OSHA requirements. Furthermore, open-cut excavations up to a maximum depth of ten (10) feet should be sloped to 2H: 1V or flatter slopes or be braced using an approved bracing plan. Excavated materials should not be stockpiled at the top of any slope within a horizontal distance equal to the excavation depth.

### **Foundation Excavation and Final Compaction**

It is considered essential that all foundation excavations be observed by a geotechnical engineer or an approved representative to ensure that footings are placed on suitable load bearing materials. If unsuitable materials are encountered in the footing excavations, the materials should be removed and the footings placed at lower

elevations. This backfilling may be done with a very lean concrete or with a well-compacted, suitable fill such as “clean” sand, gravel, or crushed FDOT No. 57 or FDOT No. 67 stone.

Exposure to the environment may weaken the soils at the footing bearing level if the foundation excavations remain open for too long a time. Therefore, foundation concrete should be placed the same day that excavations are dug during the rainy season or if rain is anticipated. If the bearing soils are softened by surface water intrusion or exposure, the softened soils must be removed from the foundation excavation bottom immediately prior to placement of concrete. If the excavation must remain open overnight, or if rainfall becomes imminent while the bearing soils are exposed, we recommend that a 1- to 3-inch thick "mud-mat" of "lean" concrete be placed on the bearing soils before the placement of reinforcing steel.

The bottom of the foundation excavations should be compacted to densify soils loosen during or after the excavation process and washed or sloughed into the excavation prior to the placement of forms. A heavy-duty vibratory rammer should be used for this final compaction, immediately prior to the placement of reinforcing steel, with previously described minimum dry density requirements to be maintained below the foundation level.

After foundation forms are removed, backfill around foundations should be placed in lifts six inches or less in thickness, with each lift individually compacted with a plate tamper. The backfill should be compacted to a dry density of at least 95% of the modified Proctor (ASTM D-1557) maximum dry density, with the top one foot being compacted to 98% of a modified proctor value.

### **Additional Recommendations**

All erosion and sedimentation shall be controlled in accordance with sound engineering practice and current state and local requirements. In a dry and undisturbed state, the upper one foot of the majority of the soils at the site will provide good subgrade support for fill placement and construction operations. However, when wet, these soils will degrade quickly with disturbance from contractor operations. Therefore, good site drainage should be maintained during earthwork operations, which will help maintain the integrity of the soil. The surface of the site should be kept properly graded in order to enhance drainage of the surface water away from the proposed structural areas during the construction phase. We recommend that an attempt be made to enhance the natural drainage without interrupting its pattern.

Care must be exercised prior to, during and after construction to prevent erosion effects or undermining of foundations. The integrity of the raised building "pad" must hence be

maintained for a distance of at least five feet beyond the foundation edges, with gutters disposing of rainfall runoff beyond the pad limits.

Foundation concrete should not be cast over a foundation surface containing topsoil or organic soils, trash of any kind, surface made muddy by rainfall runoff, or groundwater rise, or loose soil caused by excavation or other construction work. Reinforcing steel should also be clean at the time of concrete casting. If such conditions develop during construction, the reinforcing steel must be lifted out and the foundation surface reconditioned and approved by the Foundation Engineer.

### **Quality Control**

In order to verify the contractor's compliance with the above recommendations, we should be requested to inspect earthwork operation in order to verify that foundation bearing conditions are consistent with our recommendations.

## **4.6 BORROW AND ON-SITE SOIL SUITABILITY**

Fine sand (SP), and/or material that has fines less than 12%, can be utilized as structural and pavement subgrade fill material provided that the natural moisture content is within a desirable range to obtain compaction.

Fine sand with silt (SP-SM) or fine sand with clay (SP-SC) can be utilized as structural and pavement subgrade fill material provided that the natural moisture content is within a desirable range to obtain compaction. It should be noted that due to higher fine content, soil may be more sensitive to moisture changes and may require more handling.

Clayey fine sand (SC) and silty fine sand (SM) are more difficult to use as fill because they are more moisture sensitive. These soils may be utilized under the building and pavement areas with a minimum of 3 feet of fine sand (SP) topping over the silty/clayey soil.

All materials to be used for backfill or mass grading fill construction should be evaluated and, if necessary, tested by NOVA prior to placement to determine if they are suitable for the intended use. In general, based upon the boring results, the near surface sands with limestone fragments such as those encountered in the borings within the top 10 to 15 feet of the subsurface can be used as a structural fill as well as general subgrade fill and backfill, provided that the fill material is free of rubble, clay, rock, roots and organics. Any off-site materials used as fill should be approved by NOVA prior to acquisition.

## 4.7 PAVEMENT CONSIDERATIONS

We recommend using a flexible pavement system (asphaltic concrete) for the construction of the paved parking areas and access roadways. Our pavement recommendations are presented in this section. It should be realized that the pavement recommendations presented below are considered minimum for the site, soil and limited traffic conditions expected.

Based on the results of our test borings, the subsurface conditions encountered are well suited for the following pavement sections, provided a minimum separation of at least 18 inches between the bottom of an FDOT crushed limerock base course and the seasonal high groundwater table is maintained. The final pavement thickness design should be determined by the project Civil Engineer using information obtained from the subsurface exploration program and an analysis of anticipated traffic conditions.

The following flexible pavement sections have been established using the “*Flexible Pavement Design Manual*” as published by the Florida Department of Transportation. Please note that flexible pavement sections are not recommended for areas where truck traffic will be accelerating, decelerating or turning. A design life of 20 years was used in the analysis.

**FLEXIBLE PAVEMENT SECTION**

Pavement Area	Stabilized Subbase Type “B”	Limerock/ Crushed Concrete Base	Asphaltic Concrete (SP-12.5 and/or FC-9.5)
Standard Duty (Parking)	12 inches	6 inches	1” SP 9.5 2” SP 12.5
Heavy Duty (Driveway and Access Road)	12 inches	8 inches	1” SP 9.5 3” SP 12.5

The preceding flexible pavement section recommendations are based on an assumed Limerock Bearing Ratio (LBR) value for the compacted subgrade of 40. LBR test was not performed in the current study. Based on our experience with similar materials in the general area of the site, the fill materials should meet this requirement. This LBR value should be confirmed through testing during the construction stage of the project.

The asphaltic concrete should be constructed using structural course of Type SP-12.5 and friction course of Type SP-9.5. The asphaltic concrete should meet standard FDOT material requirements and placement procedures as outlined in the current FDOT Standard Specifications for Road and Bridge Construction.

The following recommendations are provided for pavement construction:

1. Proof-roll the exposed stripped natural subgrade and compact to at least 95% of the Modified Proctor maximum dry density (ASTM D1557).

2. Provide the recommended Type “B” stabilized subgrade section. The stabilized soils should be compacted to at least 98% density (ASTM D1557), and should possess a Limerock Bearing Ratio of at least 40 percent.
3. Provide the recommended thickness base section consisting of limerock or crushed concrete base course materials (minimum LBR of 100 percent). Compact in-place to a minimum 98% density (ASTM D1557). Install per Florida Department of Transportation specifications.
4. Provide the recommended minimum thickness of asphalt supplied and installed per FDOT requirements.

## 4.8 SEISMIC CONSIDERATIONS

Florida is not in a seismic active area. The International Building Code (IBC) 2000 requires site classification for seismic design based on the upper 100 feet of a soil profile. The seismic site class definitions for the weighted average of shear wave velocity in the upper 100 feet of the soil and rock profile are presented in Table 1615.1.1 of the 2000 IBC Code (as adopted by FBC 2004) and in the table below.

SEISMIC SITE CLASSIFICATION		
Site Class	Soil Profile Name	Shear Wave Velocity, $V_s$ , (feet/s)
A	Hard Rock	$V_s > 5,000$ fps
B	Rock	$2,500 < V_s \leq 5,000$ fps
C	Very dense soil and soft rock	$1,200 < V_s \leq 2,500$ fps
D	Stiff Soil Profile	$600 \leq V_s \leq 1,200$ fps
E	Soft Soil Profile	$V_s < 600$ fps

Considering the soil profile encountered at this site and previous experience within the upper 100-foot of soil in the area, we recommend a seismic site classification of Site Class C.

We have reviewed the IBC and related building codes in regard to seismic considerations for the site. All of Florida falls below coefficient values of 0.05 g for both peak ground acceleration and peak velocity-related acceleration. Accordingly, the liquefaction potential of the site due to earthquake forces is negligible.

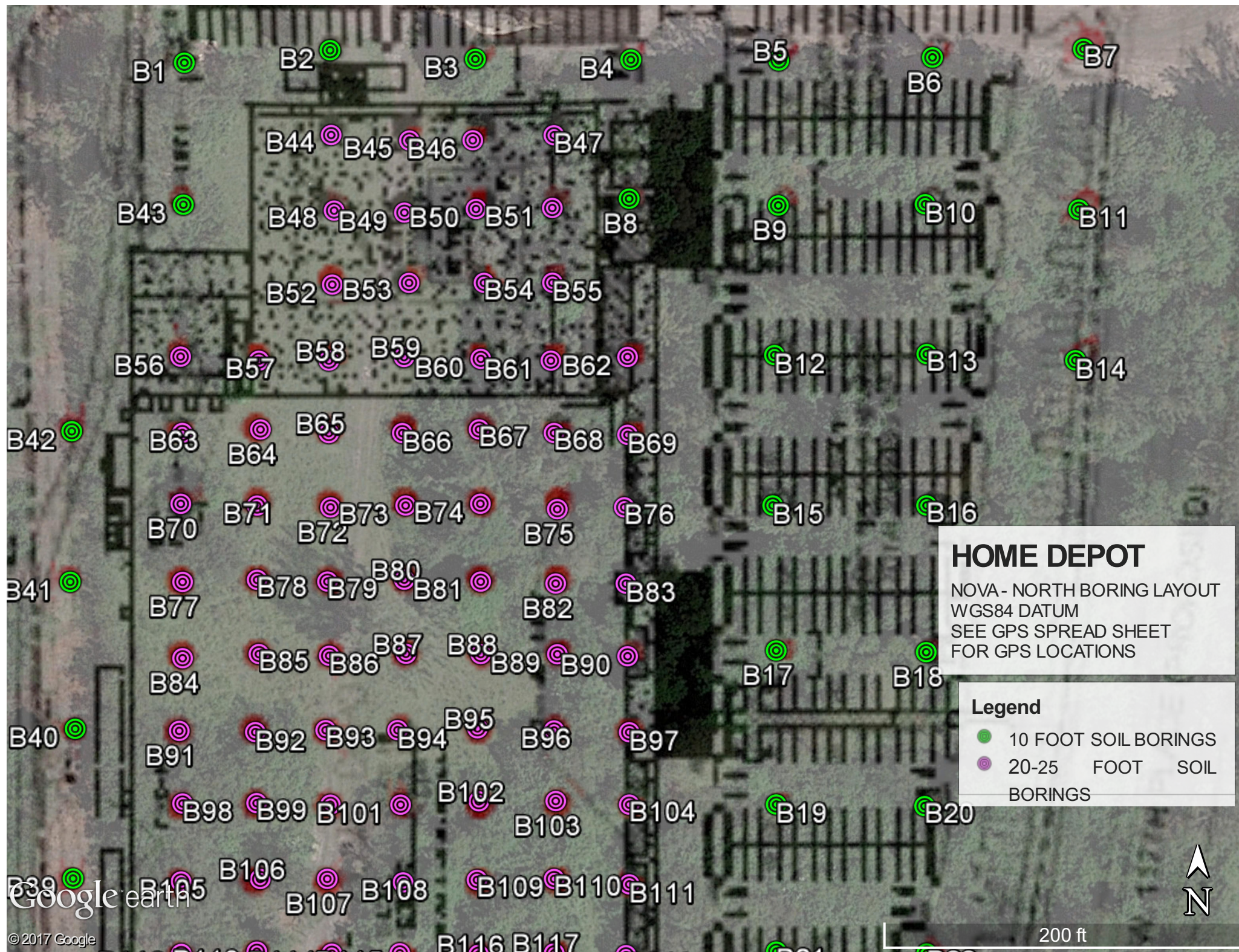
Additionally, based on the USGS United States National Seismic Hazard Maps, the project site is located in the lowest hazard zone with levels of horizontal shaking not

exceeding 0 to 4 percent, and the subject property is not located within a Seismic Hazard Zone. Therefore, the potential for seismic settlement, slope instability and ground shaking are low or low to negligible.

# **APPENDIX A**

## **Field Exploration**

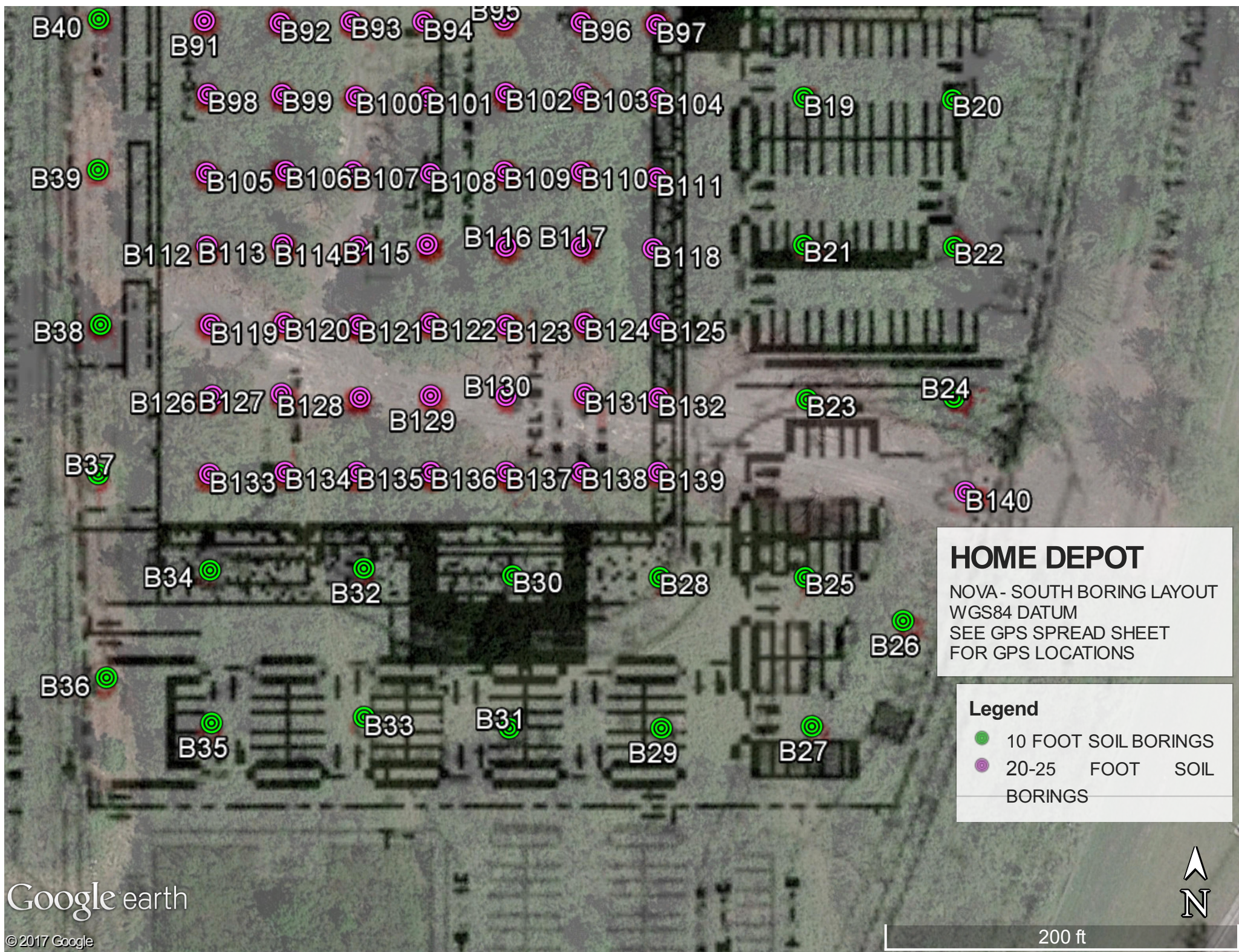




**HOME DEPOT**  
NOVA - NORTH BORING LAYOUT  
WGS84 DATUM  
SEE GPS SPREAD SHEET  
FOR GPS LOCATIONS

- Legend**
- 10 FOOT SOIL BORINGS
  - 20-25 FOOT SOIL BORINGS







HOME DEPOT BORING LAYOUT			PAGE 1	WGS84 DATUM	
B 1	25°47'22.57"N	80°23'19.57"W	B 44	25°47'22.18"N	80°23'18.68"W
B 2	25°47'22.64"N	80°23'18.68"W	B 45	25°47'22.15"N	80°23'18.20"W
B 3	25°47'22.59"N	80°23'17.79"W	B 46	25°47'22.15"N	80°23'17.81"W
B 4	25°47'22.57"N	80°23'16.84"W	B 47	25°47'22.17"N	80°23'17.31"W
B 5	25°47'22.57"N	80°23'15.94"W	B 48	25°47'21.76"N	80°23'18.66"W
B 6	25°47'22.58"N	80°23'15.01"W	B 49	25°47'21.75"N	80°23'18.23"W
B 7	25°47'22.62"N	80°23'14.10"W	B 50	25°47'21.77"N	80°23'17.79"W
B 8	25°47'21.82"N	80°23'16.85"W	B 51	25°47'21.77"N	80°23'17.32"W
B 9	25°47'21.78"N	80°23'15.94"W	B 52	25°47'21.35"N	80°23'18.67"W
B 10	25°47'21.79"N	80°23'15.04"W	B 53	25°47'21.36"N	80°23'18.20"W
B 11	25°47'21.76"N	80°23'14.10"W	B 54	25°47'21.36"N	80°23'17.74"W
B 12	25°47'20.96"N	80°23'15.96"W	B 55	25°47'21.36"N	80°23'17.32"W
B 13	25°47'20.96"N	80°23'15.03"W	B 56	25°47'20.95"N	80°23'19.59"W
B 14	25°47'20.93"N	80°23'14.12"W	B 57	25°47'20.93"N	80°23'19.12"W
B 15	25°47'20.13"N	80°23'15.97"W	B 58	25°47'20.93"N	80°23'18.69"W
B 16	25°47'20.13"N	80°23'15.03"W	B 59	25°47'20.95"N	80°23'18.23"W
B 17	25°47'19.33"N	80°23'15.95"W	B 60	25°47'20.94"N	80°23'17.76"W
B 18	25°47'19.32"N	80°23'15.03"W	B 61	25°47'20.93"N	80°23'17.33"W
B 19	25°47'18.48"N	80°23'15.95"W	B 62	25°47'20.95"N	80°23'16.86"W
B 20	25°47'18.47"N	80°23'15.04"W	B 63	25°47'20.53"N	80°23'19.58"W
B 21	25°47'17.67"N	80°23'15.95"W	B 64	25°47'20.55"N	80°23'19.11"W
B 22	25°47'17.66"N	80°23'15.03"W	B 65	25°47'20.55"N	80°23'19.11"W
B 23	25°47'16.82"N	80°23'15.93"W	B 66	25°47'20.53"N	80°23'18.24"W
B 24	25°47'16.83"N	80°23'15.03"W	B 67	25°47'20.55"N	80°23'17.77"W
B 25	25°47'15.84"N	80°23'15.94"W	B 68	25°47'20.53"N	80°23'17.31"W
B 26	25°47'15.60"N	80°23'15.34"W	B 69	25°47'20.52"N	80°23'16.86"W
B 27	25°47'15.02"N	80°23'15.90"W	B 70	25°47'20.14"N	80°23'19.59"W
B 28	25°47'15.84"N	80°23'16.83"W	B 71	25°47'20.13"N	80°23'19.13"W
B 29	25°47'15.01"N	80°23'16.82"W	B 72	25°47'20.12"N	80°23'18.68"W
B 30	25°47'15.85"N	80°23'17.73"W	B 73	25°47'20.13"N	80°23'18.22"W
B 31	25°47'15.01"N	80°23'17.75"W	B 74	25°47'20.14"N	80°23'17.76"W
B 32	25°47'15.89"N	80°23'18.64"W	B 75	25°47'20.11"N	80°23'17.29"W
B 33	25°47'15.07"N	80°23'18.64"W	B 76	25°47'20.12"N	80°23'16.88"W
B 34	25°47'15.88"N	80°23'19.58"W	B 77	25°47'19.71"N	80°23'19.58"W
B 35	25°47'15.04"N	80°23'19.57"W	B 78	25°47'19.72"N	80°23'19.13"W
B 36	25°47'15.29"N	80°23'20.21"W	B 79	25°47'19.71"N	80°23'18.70"W
B 37	25°47'16.41"N	80°23'20.26"W	B 80	25°47'19.72"N	80°23'18.23"W
B 38	25°47'17.23"N	80°23'20.24"W	B 81	25°47'19.71"N	80°23'17.76"W
B 39	25°47'18.08"N	80°23'20.25"W	B 82	25°47'19.70"N	80°23'17.30"W
B 40	25°47'18.90"N	80°23'20.24"W	B 83	25°47'19.70"N	80°23'16.87"W
B 41	25°47'19.71"N	80°23'20.27"W	B 84	25°47'19.29"N	80°23'19.58"W
B 42	25°47'20.54"N	80°23'20.26"W	B 85	25°47'19.31"N	80°23'19.12"W
B 43	25°47'21.79"N	80°23'19.58"W	B 86	25°47'19.30"N	80°23'18.69"W

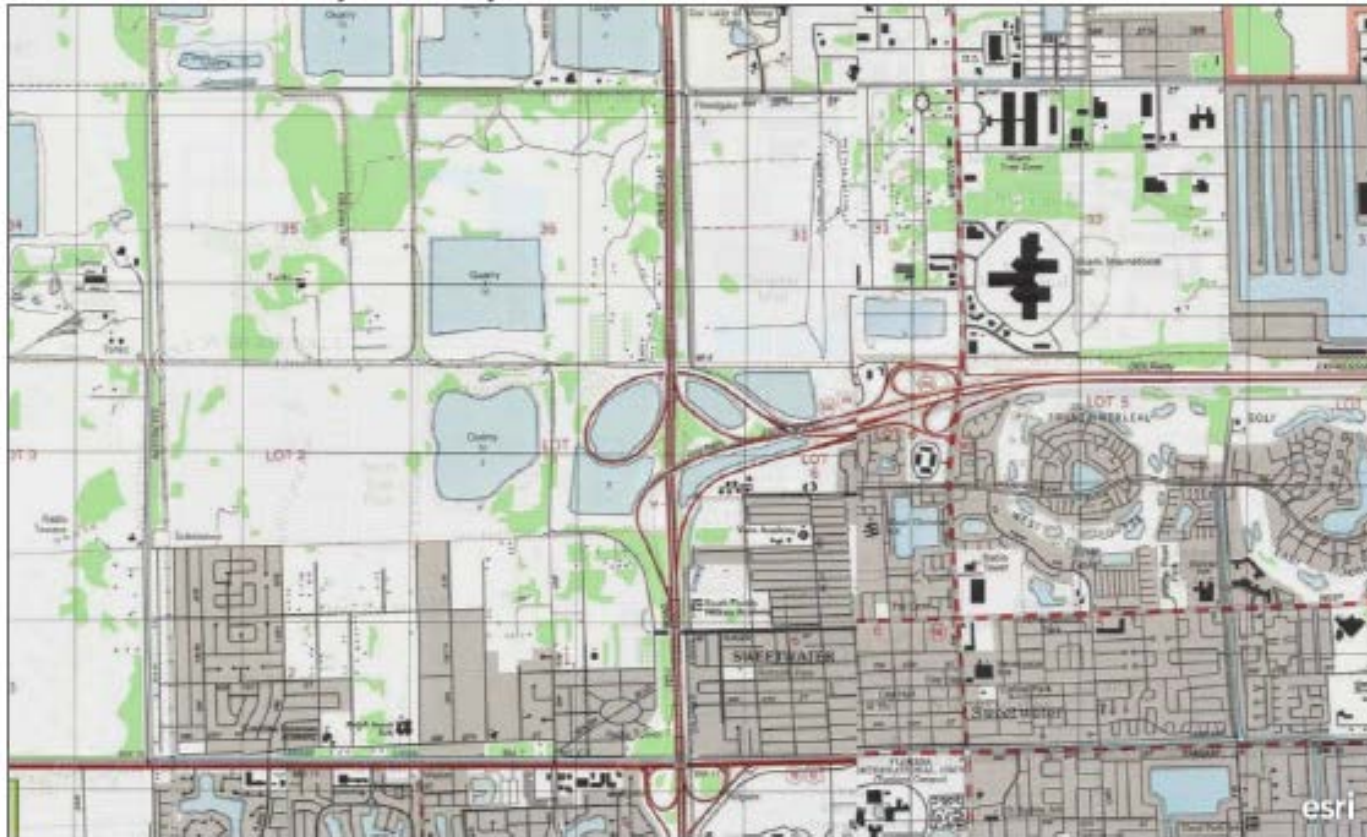
HOME DEPOT BORING LAYOUT			PAGE 2		WGS84 DATUM
B 87	25°47'19.31"N	80°23'18.22"W	B 130	25°47'16.84"N	80°23'17.77"W
B 88	25°47'19.31"N	80°23'17.76"W	B 131	25°47'16.85"N	80°23'17.29"W
B 89	25°47'19.31"N	80°23'17.29"W	B 132	25°47'16.83"N	80°23'16.84"W
B 90	25°47'19.30"N	80°23'16.86"W	B 133	25°47'16.41"N	80°23'19.58"W
B 91	25°47'18.89"N	80°23'19.60"W	B 134	25°47'16.42"N	80°23'19.12"W
B 92	25°47'18.88"N	80°23'19.14"W	B 135	25°47'16.42"N	80°23'18.68"W
B 93	25°47'18.89"N	80°23'18.71"W	B 136	25°47'16.42"N	80°23'18.23"W
B 94	25°47'18.89"N	80°23'18.27"W	B 137	25°47'16.42"N	80°23'17.77"W
B 95	25°47'18.90"N	80°23'17.78"W	B 138	25°47'16.42"N	80°23'17.31"W
B 96	25°47'18.89"N	80°23'17.31"W	B 139	25°47'16.42"N	80°23'16.84"W
B 97	25°47'18.88"N	80°23'16.85"W	B 140	25°47'16.31"N	80°23'14.96"W
B 98	25°47'18.49"N	80°23'19.58"W			
B 99	25°47'18.49"N	80°23'19.13"W			
B 100	25°47'18.48"N	80°23'18.68"W			
B 101	25°47'18.48"N	80°23'18.25"W			
B 102	25°47'18.50"N	80°23'17.77"W			
B 103	25°47'18.50"N	80°23'17.30"W			
B 104	25°47'18.48"N	80°23'16.85"W			
B 105	25°47'18.06"N	80°23'19.59"W			
B 106	25°47'18.07"N	80°23'19.11"W			
B 107	25°47'18.07"N	80°23'18.70"W			
B 108	25°47'18.06"N	80°23'18.23"W			
B 109	25°47'18.07"N	80°23'17.78"W			
B 110	25°47'18.07"N	80°23'17.31"W			
B 111	25°47'18.04"N	80°23'16.85"W			
B 112	25°47'17.66"N	80°23'19.59"W			
B 113	25°47'17.67"N	80°23'19.13"W			
B 114	25°47'17.66"N	80°23'18.67"W			
B 115	25°47'17.67"N	80°23'18.25"W			
B 116	25°47'17.66"N	80°23'17.77"W			
B 117	25°47'17.66"N	80°23'17.31"W			
B 118	25°47'17.65"N	80°23'16.87"W			
B 119	25°47'17.23"N	80°23'19.57"W			
B 120	25°47'17.24"N	80°23'19.12"W			
B 121	25°47'17.23"N	80°23'18.67"W			
B 122	25°47'17.24"N	80°23'18.23"W			
B 123	25°47'17.23"N	80°23'17.77"W			
B 124	25°47'17.24"N	80°23'17.29"W			
B 125	25°47'17.24"N	80°23'16.83"W			
B 126	25°47'16.84"N	80°23'19.56"W			
B 127	25°47'16.85"N	80°23'19.14"W			
B 128	25°47'16.83"N	80°23'18.66"W			
B 129	25°47'16.84"N	80°23'18.23"W			



11/14/2017

ArcGIS - South Miami-Dade County Florida Topo

### South Miami-Dade County Florida Topo



Changes in Wetlands in Southwestern Miami-Dade County

Esri, HERE, Garmin, INCREMENT P, USGS, METI/NASA, EPA, USDA | Copyright: © 2013 National Geographic Society, i-cubed



**TOPOGRAPHIC MAP**  
ArcGIS South Miami Dade County Florida Topo  
DATE: November 14, 2017  
SCALE: NTS

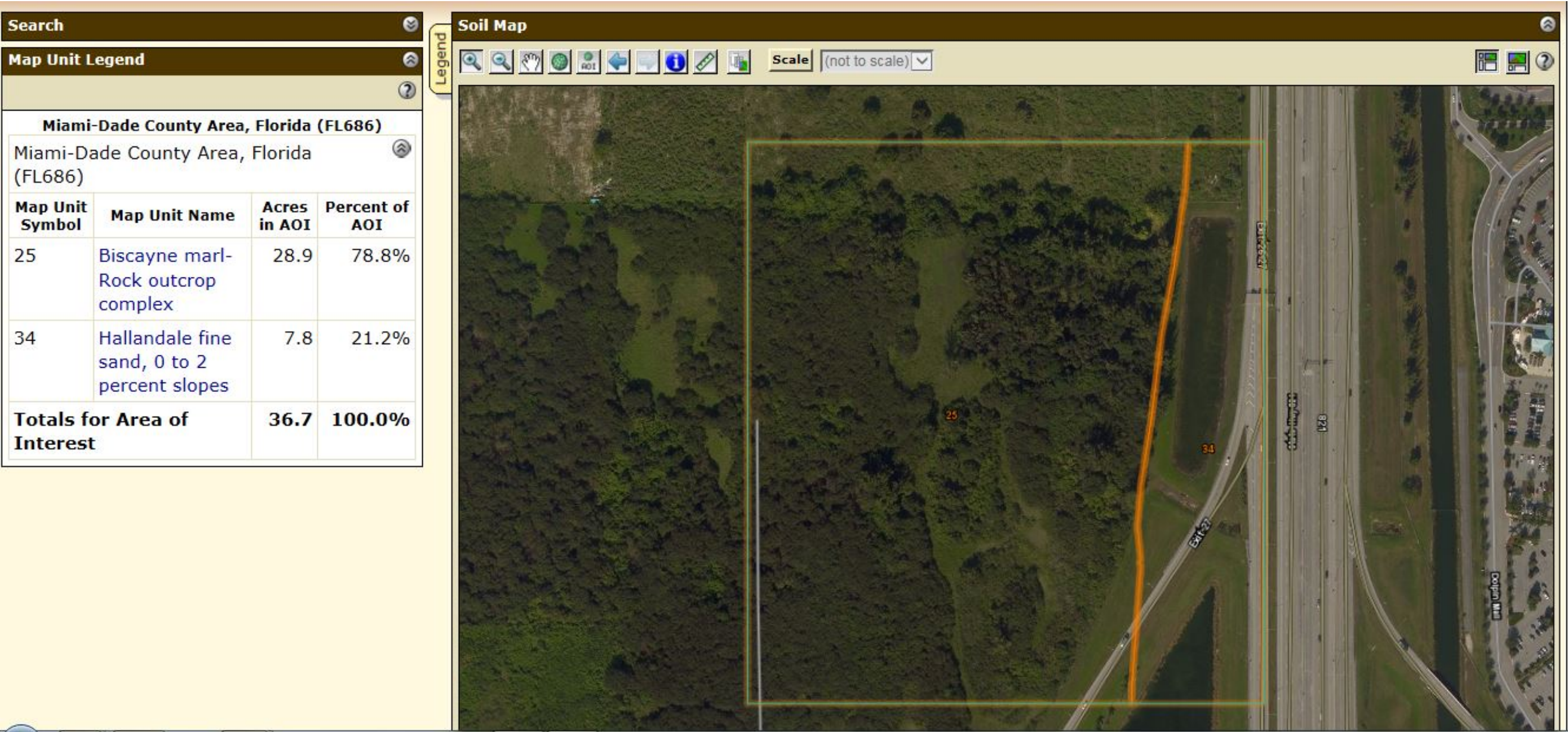


**HOME DEPOT**  
Doral, Florida

**NOVA Project Number: 10101-2017021**



U.S.D.A. SOIL SURVEY FOR MIAMI-+DADE COUNTY, FLORIDA



## KEY TO SYMBOLS AND CLASSIFICATIONS

### DRILLING SYMBOLS

	Split Spoon Sample
	Undisturbed Sample (UD)
	Standard Penetration Resistance (ASTM D1586-67)
	Water Table at least 24 Hours after Drilling
	Water Table 1 Hour or less after Drilling
100/2"	Number of Blows (100) to Drive the Spoon a Number of Inches (2)
NX, NQ	Core Barrel Sizes: 2½- and 2-Inch Diameter Rock Core, Respectively
REC	Percentage of Rock Core Recovered
RQD	Rock Quality Designation – Percentage of Recovered Core Segments 4 or more Inches Long
	Loss of Drilling Water
MC	Moisture Content Test Performed

### CORRELATION OF PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY

	<u>Number of Blows, "N"</u>	<u>Approximate Relative Density</u>
SANDS	0 – 4	Very Loose
	5 – 10	Loose
	11 – 30	Medium Dense
	31 – 50	Dense
	Over 50	Very Dense
	<u>Number of Blows, "N"</u>	<u>Approximate Consistency</u>
SILTS and CLAYS	0 – 2	Very Soft
	3 – 4	Soft
	5 – 8	Firm
	9 – 15	Stiff
	16 – 30	Very Stiff
	31 – 50	Hard
	Over 50	Very Hard

### DRILLING PROCEDURES

Soil sampling and standard penetration testing performed in accordance with ASTM D1586-67. The standard penetration resistance is the number of blows of a 140 pound hammer falling 30 inches to drive a 2-inch O.D., 1½-inch I.D. split spoon sampler one foot. Core drilling performed in accordance with ASTM D2113-62T. The undisturbed sampling procedure is described by ASTM D1587-67. Soil and rock samples will be discarded 60 days after the date of the final report unless otherwise directed.

### SOIL CLASSIFICATION CHART

<b>COARSE GRAINED SOILS</b>	<b>GRAVELS</b>	Clean Gravel less than 5% fines	GW	Well graded gravel
			GP	Poorly graded gravel
		Gravels with Fines more than 12% fines	GM	Silty gravel
			GC	Clayey gravel
	<b>SANDS</b>	Clean Sand less than 5% fines	SW	Well graded sand
			SP	Poorly graded sand
		Sands with Fines more than 12% fines	SM	Silty sand
			SC	Clayey sand
<b>FINE GRAINED SOILS</b>	<b>SILTS AND CLAYS</b> Liquid Limit less than 50	Inorganic	CL	Lean clay
			ML	Silt
		Organic	OL	Organic clay and silt
			CH	Fat clay
	<b>SILTS AND CLAYS</b> Liquid Limit 50 or more	Inorganic	MH	Elastic silt
		Organic	OH	Organic clay and silt
<b>HIGHLY ORGANIC SOILS</b>		Organic matter, dark color, organic odor	PT	Peat

### PARTICLE SIZE IDENTIFICATION

GRAVELS	Coarse	¾ inch to 3 inches
	Fine	No. 4 to ¾ inch
SANDS	Coarse	No. 10 to No. 4
	Medium	No. 40 to No. 10
	Fine	No. 200 to No. 40
SILTS AND CLAYS		Passing No. 200



# TEST BORING RECORD B1

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/18/17  
DEPTH TO - WATER> INITIAL: 1'4" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				5										
						42										
4						13										
						51										
8						29										
		Boring Terminated at 10' ft.														
12																
16																
20																
24																
28																





# TEST BORING RECORD B2

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/18/17  
DEPTH TO - WATER> INITIAL: 1'4" AFTER 24 HOURS: N/A CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				3										
						25										
4						20										
						25										
8						22										
		Boring Terminated at 10' ft.														
12																
16																
20																
24																
28																



# TEST BORING RECORD B3

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/19/17  
DEPTH TO - WATER> INITIAL: 1'4" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, Loose-Brown-Sand Tan Sandy Oolitic LIMESTONE				6	●									
						19		●								
4						17		●								
						18		●								
8						22		●								
		Boring Terminated at 10' ft.														
12																
16																
20																
24																
28																



# TEST BORING RECORD B4

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/19/17  
DEPTH TO - WATER> INITIAL: 1'4" AFTER 24 HOURS: N/A CAVING> C

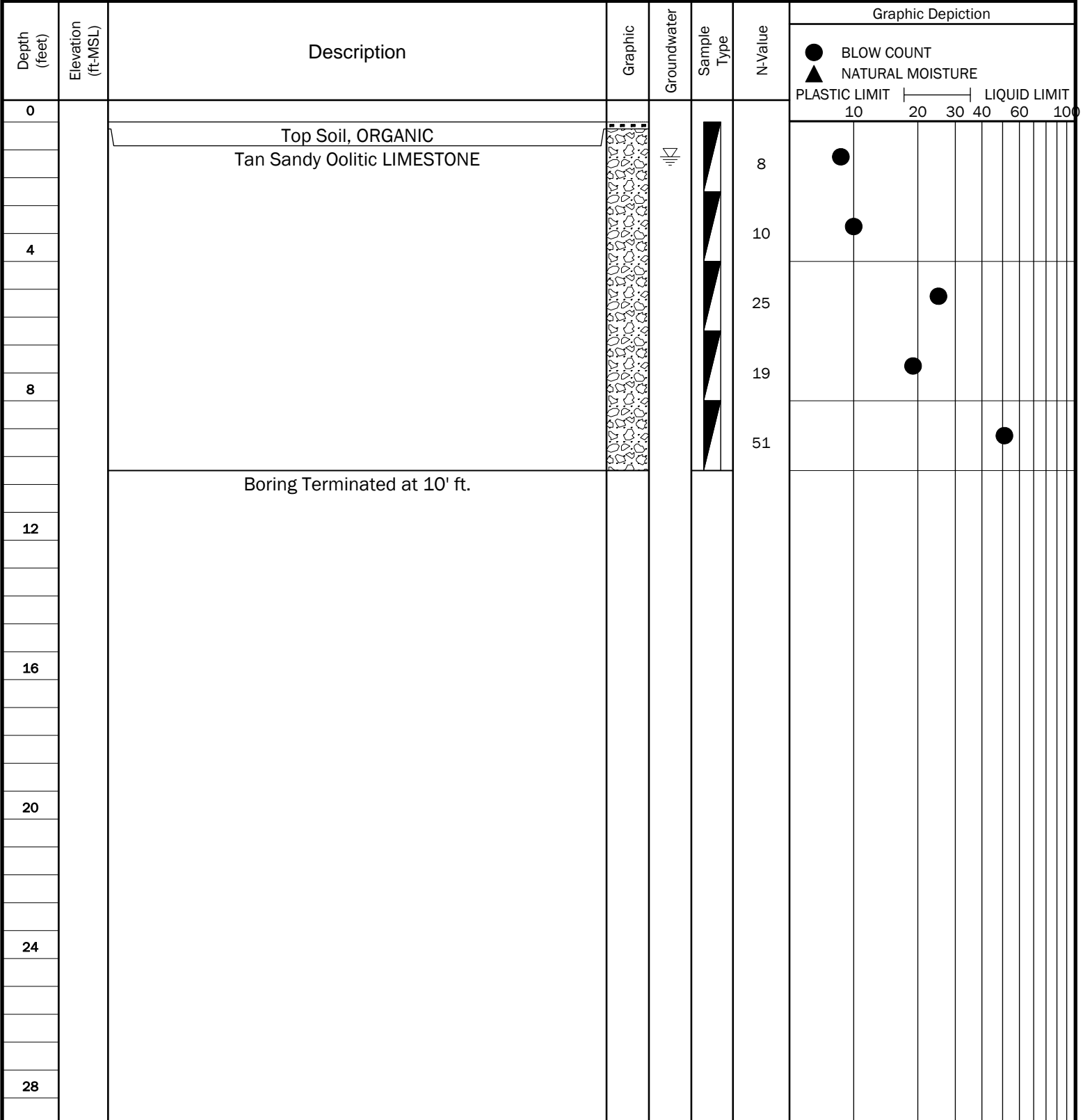
This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, Loose-Brown-Sand Tan Sandy Oolitic LIMESTONE				8	●									
						19		●								
4						18		●								
						20		●								
8						22		●								
		Boring Terminated at 10' ft.														
12																
16																
20																
24																
28																



# TEST BORING RECORD B5

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/19/17  
DEPTH TO - WATER> INITIAL: 1'4" AFTER 24 HOURS: N/A CAVING> C





# TEST BORING RECORD B6

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/18/17  
DEPTH TO - WATER> INITIAL: 1'4" AFTER 24 HOURS: N/A CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				14										
						11										
4						11										
						16										
8						13										
		Boring Terminated at 10' ft.														
12																
16																
20																
24																
28																



# TEST BORING RECORD B7

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/18/17  
DEPTH TO - WATER> INITIAL: 1'4" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				9										
						11										
4						11										
						17										
8						16										
		Boring Terminated at 10' ft.														
12																
16																
20																
24																
28																



# TEST BORING RECORD B8

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/19/17  
DEPTH TO - WATER> INITIAL: 1'4" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				8	●									
						14		●								
4						13		●								
						15		●								
8						15		●								
		Boring Terminated at 10' ft.														
12																
16																
20																
24																
28																



# TEST BORING RECORD B9

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/19/17  
DEPTH TO - WATER> INITIAL: 1'4" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, sand with traces of roots														
		Tan Sandy Oolitic LIMESTONE				4										
4						38										
						27										
8						18										
						14										
		Boring Terminated at 10' ft.														
12																
16																
20																
24																
28																





# TEST BORING RECORD B10

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/19/17  
DEPTH TO - WATER> INITIAL: 1'4" AFTER 24 HOURS: N/A CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				16										
						23										
4						17										
						24										
8						18										
		Boring Terminated at 10' ft.														
12																
16																
20																
24																
28																



# TEST BORING RECORD B11

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/19/17  
DEPTH TO - WATER> INITIAL: 1'4" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, Sand with traces of roots														
		Tan Sandy Oolitic LIMESTONE				8										
						8										
4																
						25										
						19										
8		Tan LIMESTONE														
						50										
		Boring Terminated at 10' ft.														
12																
16																
20																
24																
28																



# TEST BORING RECORD B12

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/19/17  
DEPTH TO - WATER> INITIAL: 1'4" AFTER 24 HOURS: N/A CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, Medium dense, Brown, Sand														
		Tan Sandy Oolitic Limestone				12										
						37										
4						19										
						23										
8						15										
		Boring Terminated at 10' ft.														
12																
16																
20																
24																
28																



# TEST BORING RECORD B13

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/19/17  
DEPTH TO - WATER> INITIAL: 1'4" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				38										
						24										
4						16										
						25										
8						17										
		Boring Terminated at 10' ft.														
12																
16																
20																
24																
28																



# TEST BORING RECORD B14

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/19/17  
DEPTH TO - WATER> INITIAL: 1'4" AFTER 24 HOURS: N/A CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				41										
						24										
4						18										
						24										
8						17										
		Boring Terminated at 10' ft.														
12																
16																
20																
24																
28																



# TEST BORING RECORD B15

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/19/17  
DEPTH TO - WATER> INITIAL: 1'4" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div><div>● BLOW COUNT</div><div>▲ NATURAL MOISTURE</div><div>PLASTIC LIMIT   LIQUID LIMIT</div><div>10 20 30 40 60 100</div></div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				5										
						16										
4						20										
						26										
8						35										
		Boring Terminated at 10' ft.														
12																
16																
20																
24																
28																



# TEST BORING RECORD B16

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/19/17  
DEPTH TO - WATER> INITIAL: 1'4" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				12										
						28										
4						25										
						20										
8						19										
		Boring Terminated at 10' ft.														
12																
16																
20																
24																
28																



# TEST BORING RECORD B17

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/19/17  
DEPTH TO - WATER> INITIAL: 1'4" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div><div>● BLOW COUNT</div><div>▲ NATURAL MOISTURE</div><div>PLASTIC LIMIT   LIQUID LIMIT</div><div>10 20 30 40 60 100</div></div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				5										
						9										
4						18										
						28										
8						27										
		Boring Terminated at 10' ft.														
12																
16																
20																
24																
28																





# TEST BORING RECORD B18

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/19/17  
DEPTH TO - WATER> INITIAL: 1'4" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				7										
						26										
4						25										
						20										
8						22										
		Boring Terminated at 10' ft.														
12																
16																
20																
24																
28																



# TEST BORING RECORD B19

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/19/17  
DEPTH TO - WATER> INITIAL: 1'4" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				10										
						31										
4						19										
						19										
8						17										
		Boring Terminated at 10' ft.														
12																
16																
20																
24																
28																



# TEST BORING RECORD B20

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/20/17  
DEPTH TO - WATER> INITIAL: 1'4" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				14										
4						20										
						15										
8						27										
		Tan LIMESTONE				44										
		Boring Terminated at 10' ft.														
12																
16																
20																
24																
28																



# TEST BORING RECORD B21

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/20/17  
DEPTH TO - WATER> INITIAL: 1'4" AFTER 24 HOURS: N/A CAVING> C

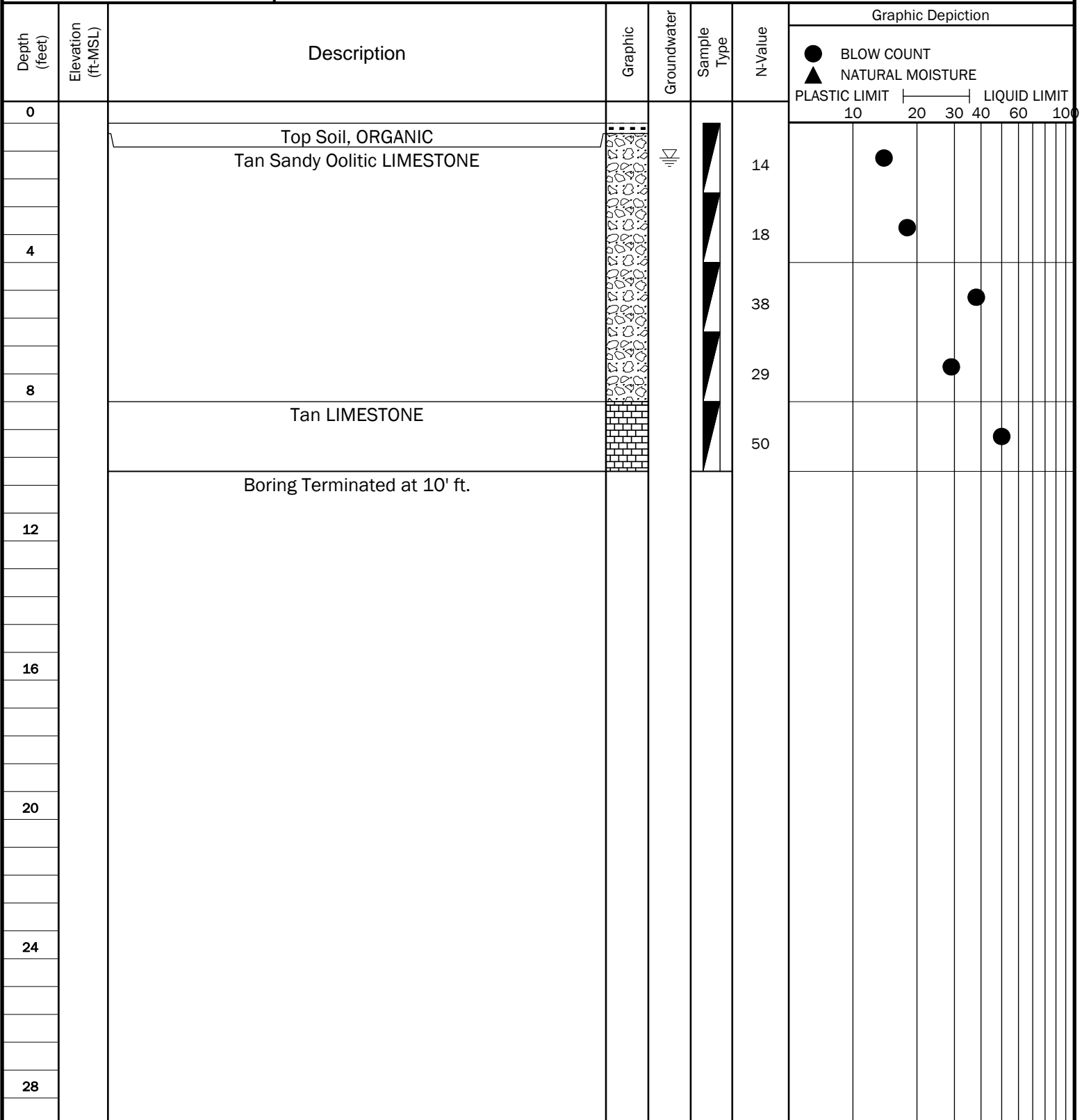
This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				30										
						21										
4						17										
						20										
8						16										
		Boring Terminated at 10' ft.														
12																
16																
20																
24																
28																



# TEST BORING RECORD B22

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/20/17  
DEPTH TO - WATER> INITIAL: 1'4" AFTER 24 HOURS: N/A CAVING> C





# TEST BORING RECORD B23

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/20/17  
DEPTH TO - WATER> INITIAL: 1'4" AFTER 24 HOURS: N/A CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				15										
						23										
4						19										
						20										
8						15										
		Boring Terminated at 10' ft.														
12																
16																
20																
24																
28																



# TEST BORING RECORD B24

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/20/17  
DEPTH TO - WATER> INITIAL: 1'4" AFTER 24 HOURS: N/A CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, Sand with traces of roots														
		Tan Sandy Oolitic LIMESTONE				10										
						20										
4						22										
						25										
8						19										
		Boring Terminated at 10' ft.														
12																
16																
20																
24																
28																



# TEST BORING RECORD B25

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/20/17  
DEPTH TO - WATER> INITIAL: 1'4" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				11										
						15										
4						19										
						21										
8						17										
		Boring Terminated at 10' ft.														
12																
16																
20																
24																
28																





# TEST BORING RECORD B26

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/20/17  
DEPTH TO - WATER> INITIAL: 1'4" AFTER 24 HOURS: N/A CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top soil, Loose, Brown, Sand														
		Tan Sandy Oolitic LIMESTONE				10										
						18										
4						16										
						23										
8						18										
		Boring Terminated at 10' ft.														
12																
16																
20																
24																
28																



# TEST BORING RECORD B27

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/20/17  
DEPTH TO - WATER> INITIAL: 1'4" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				4										
4						14										
						18										
8						22										
						21										
		Boring Terminated at 10' ft.														
12																
16																
20																
24																
28																



# TEST BORING RECORD B28

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/20/17  
DEPTH TO - WATER> INITIAL: 1'4" AFTER 24 HOURS: N/A CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				35										
						27										
4						21										
						20										
8						21										
		Boring Terminated at 10' ft.														
12																
16																
20																
24																
28																



# TEST BORING RECORD B29

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/20/17  
DEPTH TO - WATER> INITIAL: 1'4" AFTER 24 HOURS: N/A CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				6										
						15										
4						19										
						24										
8						21										
		Boring Terminated at 10' ft.														
12																
16																
20																
24																
28																



# TEST BORING RECORD B30

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/20/17  
DEPTH TO - WATER> INITIAL: 1'10" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, Loose, Brown Sand with Limestone														
		Tan Sandy Oolitic LIMESTONE				6	●									
						23				●						
4						22				●						
						8	●									
8						26				●						
		Boring Terminated at 10' ft.														
12																
16																
20																
24																
28																



# TEST BORING RECORD B31

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/20/17  
DEPTH TO - WATER> INITIAL: 1'10" AFTER 24 HOURS: N/A CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, Organic														
		Tan Sandy Oolitic LIMESTONE				11										
						21										
4						21										
						9										
8						26										
		Boring Terminated at 10' ft.														
12																
16																
20																
24																
28																



# TEST BORING RECORD B32

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/20/17  
DEPTH TO - WATER> INITIAL: 1'8" AFTER 24 HOURS: N/A CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, Organic														
		Tan Sandy Oolitic LIMESTONE				7										
						12										
4						15										
						15										
8						24										
		Boring Terminated at 10' ft.														
12																
16																
20																
24																
28																



# TEST BORING RECORD B33

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/20/17  
DEPTH TO - WATER> INITIAL: 1'8" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, Organic				3	●									
		Tan Sandy Oolitic LIMESTONE				14		●								
4						16		●								
						16		●								
8						24			●							
		Boring Terminated at 10' ft.														
12																
16																
20																
24																
28																





# TEST BORING RECORD B34

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/20/17  
DEPTH TO - WATER> INITIAL: 1'6" AFTER 24 HOURS: N/A CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				11										
						18										
4						19										
						22										
8						37										
		Boring Terminated at 10' ft.														
12																
16																
20																
24																
28																



# TEST BORING RECORD B35

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/20/17  
DEPTH TO - WATER> INITIAL: 1'6" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div><div></div> BLOW COUNT</div> <div><div></div> NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, Organic														
		Tan Sandy Oolitic LIMESTONE				11										
						17										
4						18										
						17										
8		Tan LIMESTONE				40										
		Boring Terminated at 10' ft.														
12																
16																
20																
24																
28																



# TEST BORING RECORD B36

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/23/17  
DEPTH TO - WATER> INITIAL: 1'10" AFTER 24 HOURS: N/A CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				22										
						25										
4						26										
						25										
8						29										
		Boring Terminated at 10' ft.														
12																
16																
20																
24																
28																



# TEST BORING RECORD B37

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/23/17  
DEPTH TO - WATER> INITIAL: 1'10" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div><div>● BLOW COUNT</div><div>▲ NATURAL MOISTURE</div><div>PLASTIC LIMIT   LIQUID LIMIT</div><div>10 20 30 40 60 100</div></div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				18										
						36										
4						29										
						20										
8						22										
		Boring Terminated at 10' ft.														
12																
16																
20																
24																
28																



# TEST BORING RECORD B38

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/23/17  
DEPTH TO - WATER> INITIAL: 1'9" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				16										
						34										
4						27										
						18										
8						20										
		Boring Terminated at 10' ft.														
12																
16																
20																
24																
28																



# TEST BORING RECORD B39

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/23/17  
DEPTH TO - WATER> INITIAL: 1'9" AFTER 24 HOURS: N/A CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC				2	●									
		Tan Sandy Oolitic LIMESTONE				11	●									
4						15	●									
						18	●									
8						17	●									
		Boring Terminated at 10' ft.														
12																
16																
20																
24																
28																



# TEST BORING RECORD B40

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/23/17  
DEPTH TO - WATER> INITIAL: 1'9" AFTER 24 HOURS: N/A CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				5										
						11										
4						17										
						20										
8						19										
		Boring Terminated at 10' ft.														
12																
16																
20																
24																
28																



# TEST BORING RECORD B41

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/23/17  
DEPTH TO - WATER> INITIAL: 1'9" AFTER 24 HOURS: N/A CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				19										
						21										
4						15										
						20										
8						16										
		Boring Terminated at 10' ft.														
12																
16																
20																
24																
28																





# TEST BORING RECORD B42

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/23/17  
DEPTH TO - WATER> INITIAL: 1'9" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				11										
						21										
4						14										
						19										
8		Tan LIMESTONE				98										
		Boring Terminated at 10' ft.														
12																
16																
20																
24																
28																



# TEST BORING RECORD B43

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/18/17  
DEPTH TO - WATER> INITIAL: 1'6" AFTER 24 HOURS: N/A CAVING> C

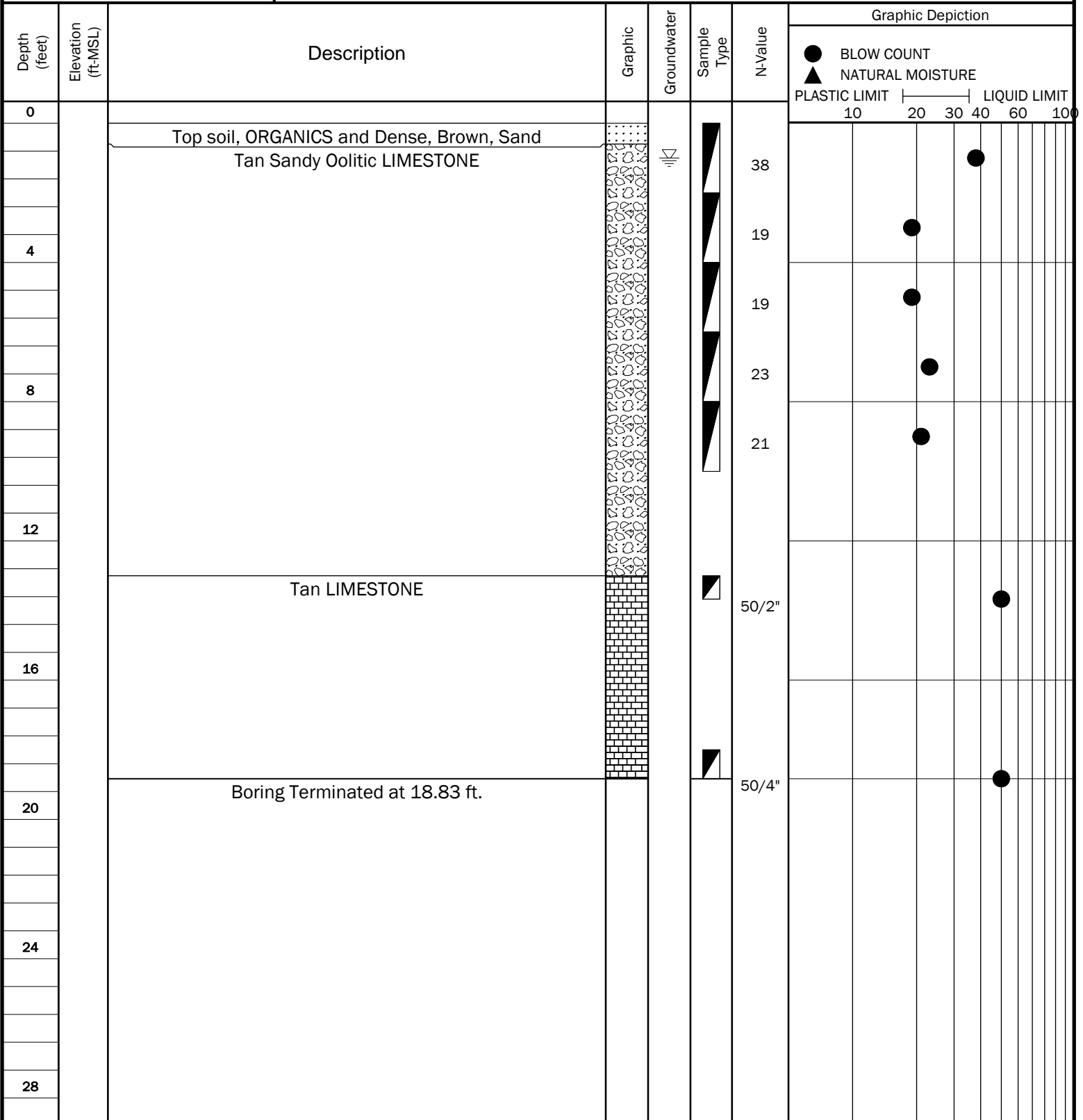
Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div><div>● BLOW COUNT</div><div>▲ NATURAL MOISTURE</div><div>PLASTIC LIMIT   LIQUID LIMIT</div><div>10 20 30 40 60 100</div></div>									
0		Top Soil, Organic				3	●									
		Tan Sandy Oolitic LIMESTONE				16		●								
4						11		●								
						16		●								
8		Tan LIMESTONE				56								●		
						50/2"								●		
12																
						50/4"								●		
16																
		Boring Terminated at 18.83 ft.														
20																
24																
28																



# TEST BORING RECORD B44

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/18/17  
DEPTH TO - WATER> INITIAL: 1'5" AFTER 24 HOURS: N/A CAVING> C

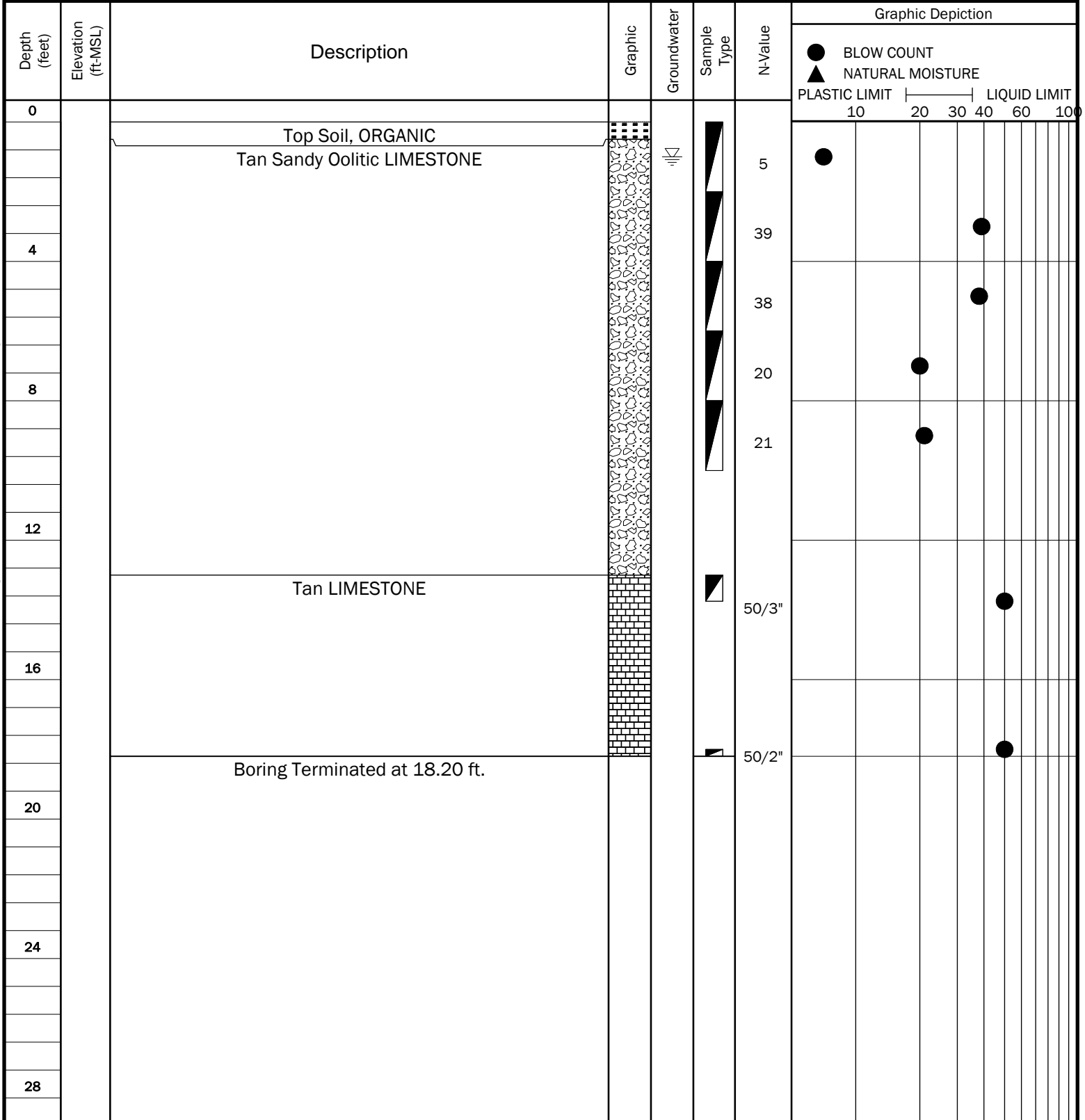
This information pertains only to this boring and should not be interpreted as being indicative of the site.





# TEST BORING RECORD B45

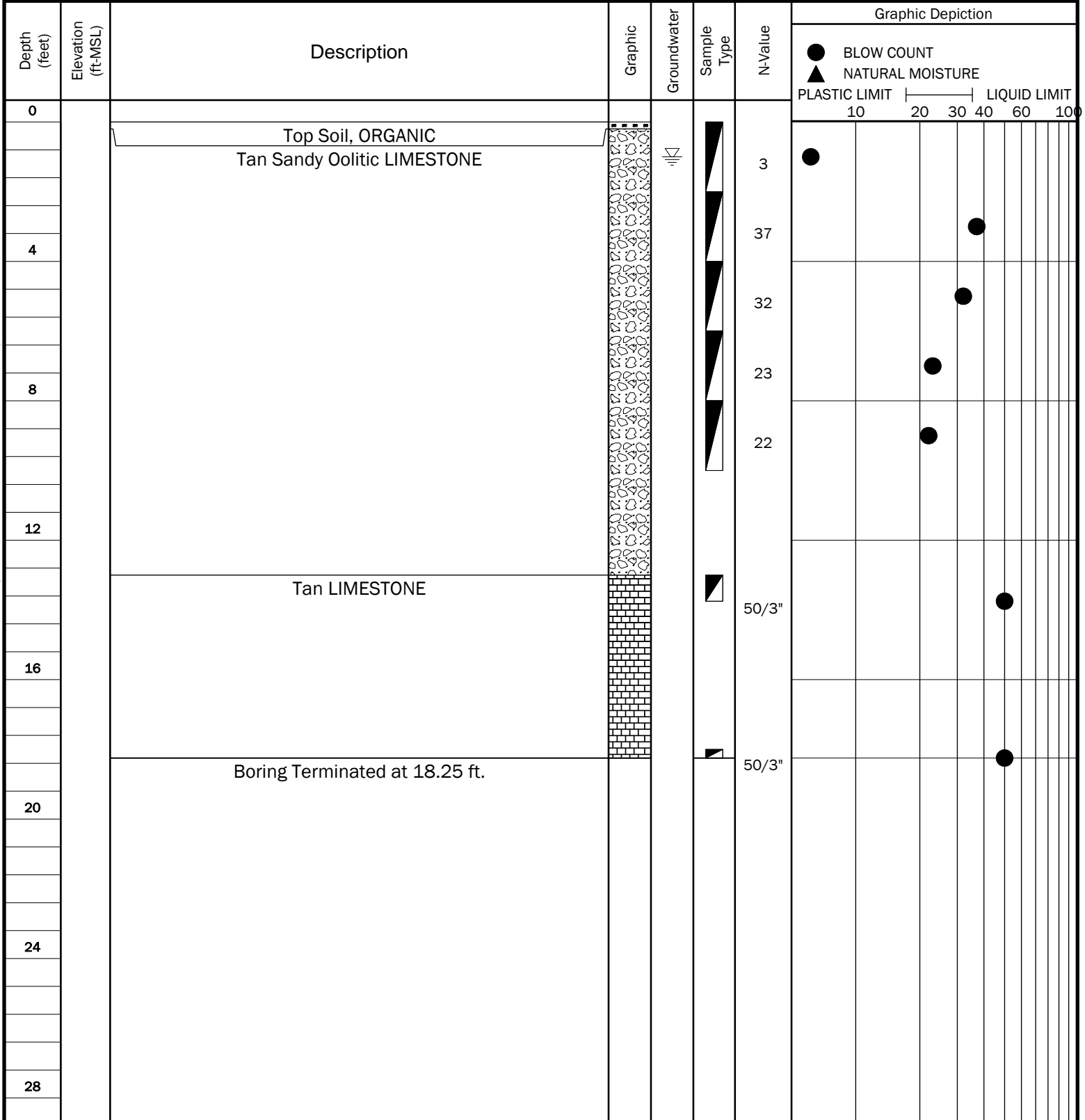
PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/18/17  
DEPTH TO - WATER> INITIAL: 1'5" AFTER 24 HOURS: N/A CAVING> C





# TEST BORING RECORD B46

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/18/17  
DEPTH TO - WATER> INITIAL: 1'10" AFTER 24 HOURS: N/A CAVING> C





# TEST BORING RECORD B47

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/18/17  
DEPTH TO - WATER> INITIAL: 1'4" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				5										
						40										
4						40										
						17										
8						22										
12		Tan LIMESTONE				68										
16						50/4"										
20		Boring Terminated at 18.83 ft.														
24																
28																



# TEST BORING RECORD B48

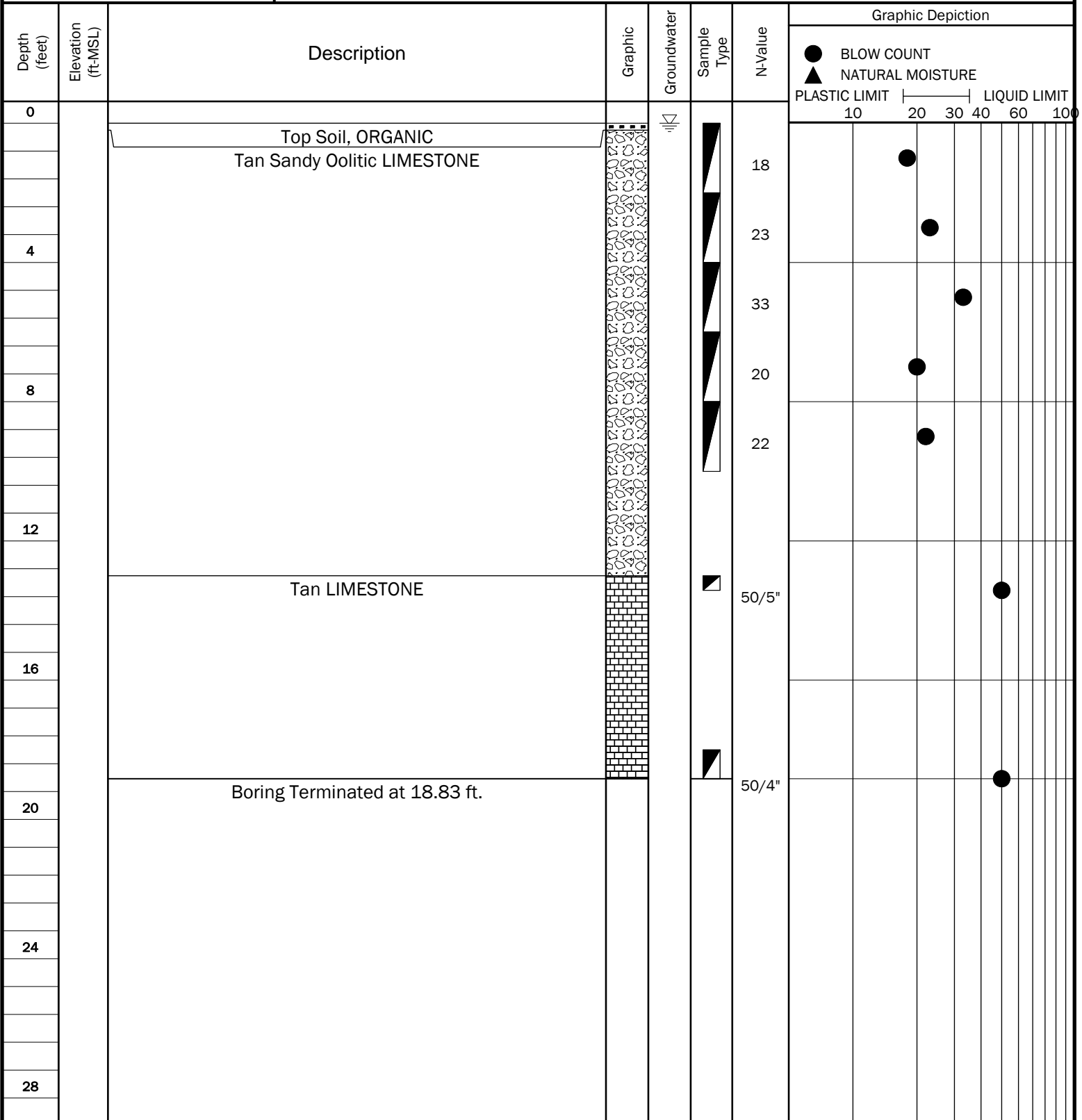
PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/31/17  
DEPTH TO - WATER> INITIAL: 1" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				18										
						26										
4						24										
						18										
8						27										
12																
		Tan LIMESTONE				50/2"										
16																
		Tan LIMESTONE				61/8"										
20		Boring Terminated at 20.0 ft.														
24																
28																



# TEST BORING RECORD B49

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 11/01/17  
DEPTH TO - WATER> INITIAL: 0'0" AFTER 24 HOURS: N/A CAVING> C

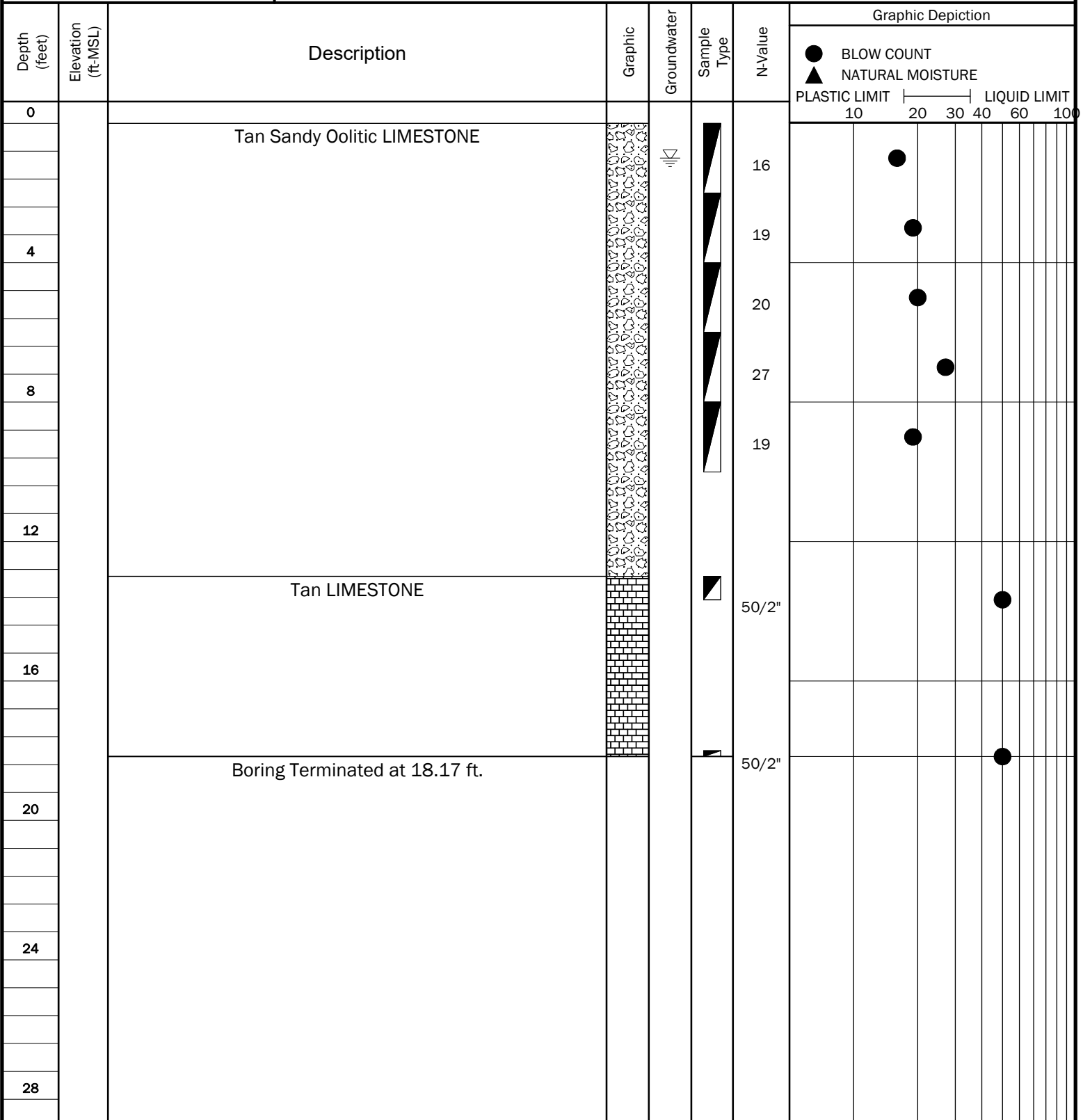






# TEST BORING RECORD B50

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 11/01/17  
DEPTH TO - WATER> INITIAL: 1" AFTER 24 HOURS: N/A CAVING> C





# TEST BORING RECORD B51

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/19/17  
DEPTH TO - WATER> INITIAL: 1'6" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div><div>● BLOW COUNT</div><div>▲ NATURAL MOISTURE</div><div>PLASTIC LIMIT 10 20 30 40 60 100</div><div>LIQUID LIMIT</div></div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				8										
						11										
4						14										
						14										
8						20										
12																
		Tan LIMESTONE				53										
16																
20		Boring Terminated at 20' ft.				78										
24																
28																



# TEST BORING RECORD B52

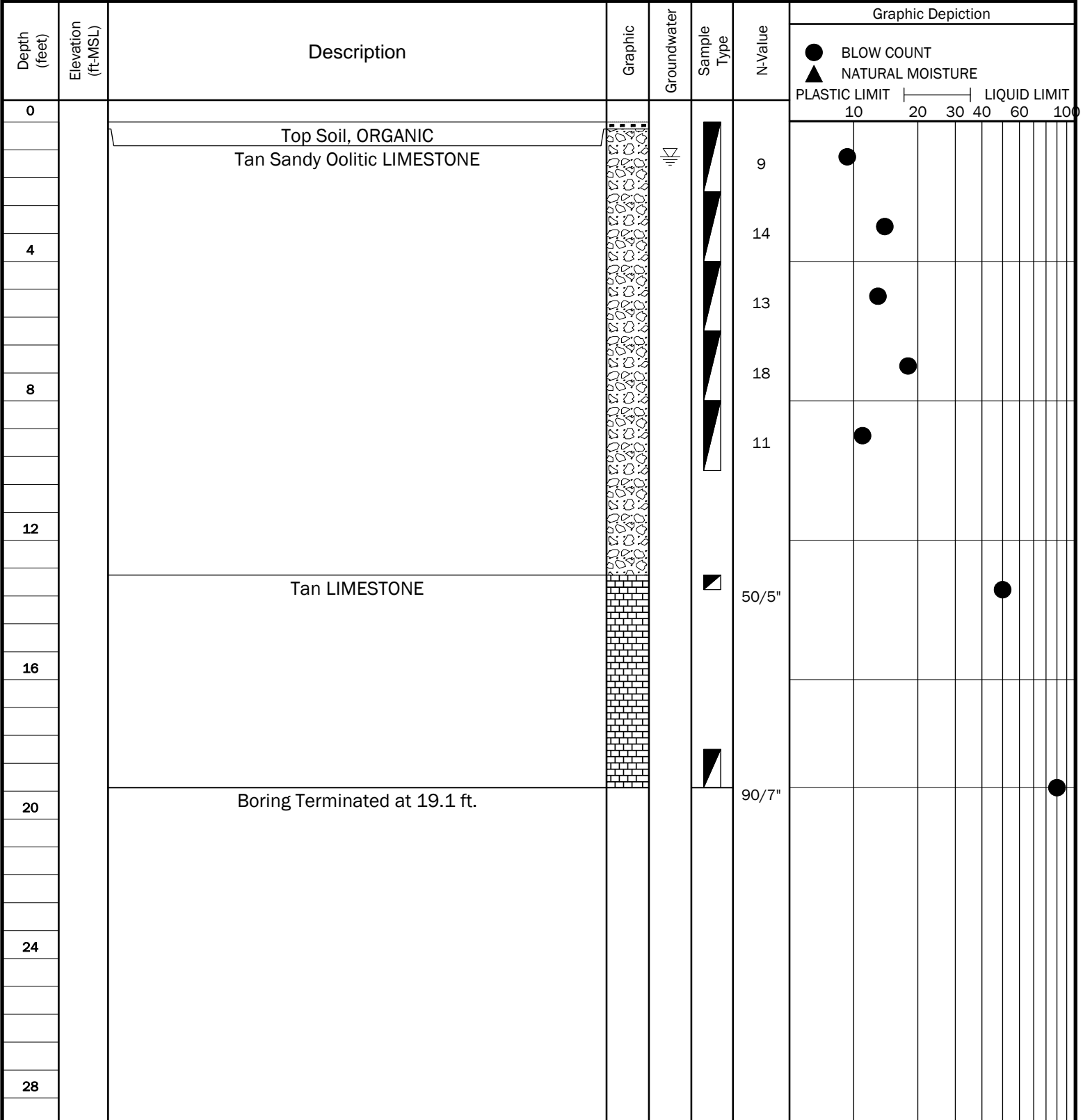
PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/30/17  
DEPTH TO - WATER> INITIAL: 1" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				3										
						12										
4						12										
						15										
8						9										
12																
		Tan LIMESTONE				50/1"										
16																
20						59										
		Boring Terminated at 20' ft.														
24																
28																



# TEST BORING RECORD B53

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/30/17  
DEPTH TO - WATER> INITIAL: 1" AFTER 24 HOURS: N/A CAVING> C





# TEST BORING RECORD B54

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 11/01/17  
DEPTH TO - WATER> INITIAL: 0'0" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0																
		Tan Sandy Oolitic LIMESTONE				18										
						28										
4						25										
						19										
8						25										
12																
		Tan LIMESTONE				50/4"										
16																
20		Boring Terminated at 18.42 ft.				50/5"										
24																
28																



# TEST BORING RECORD B55

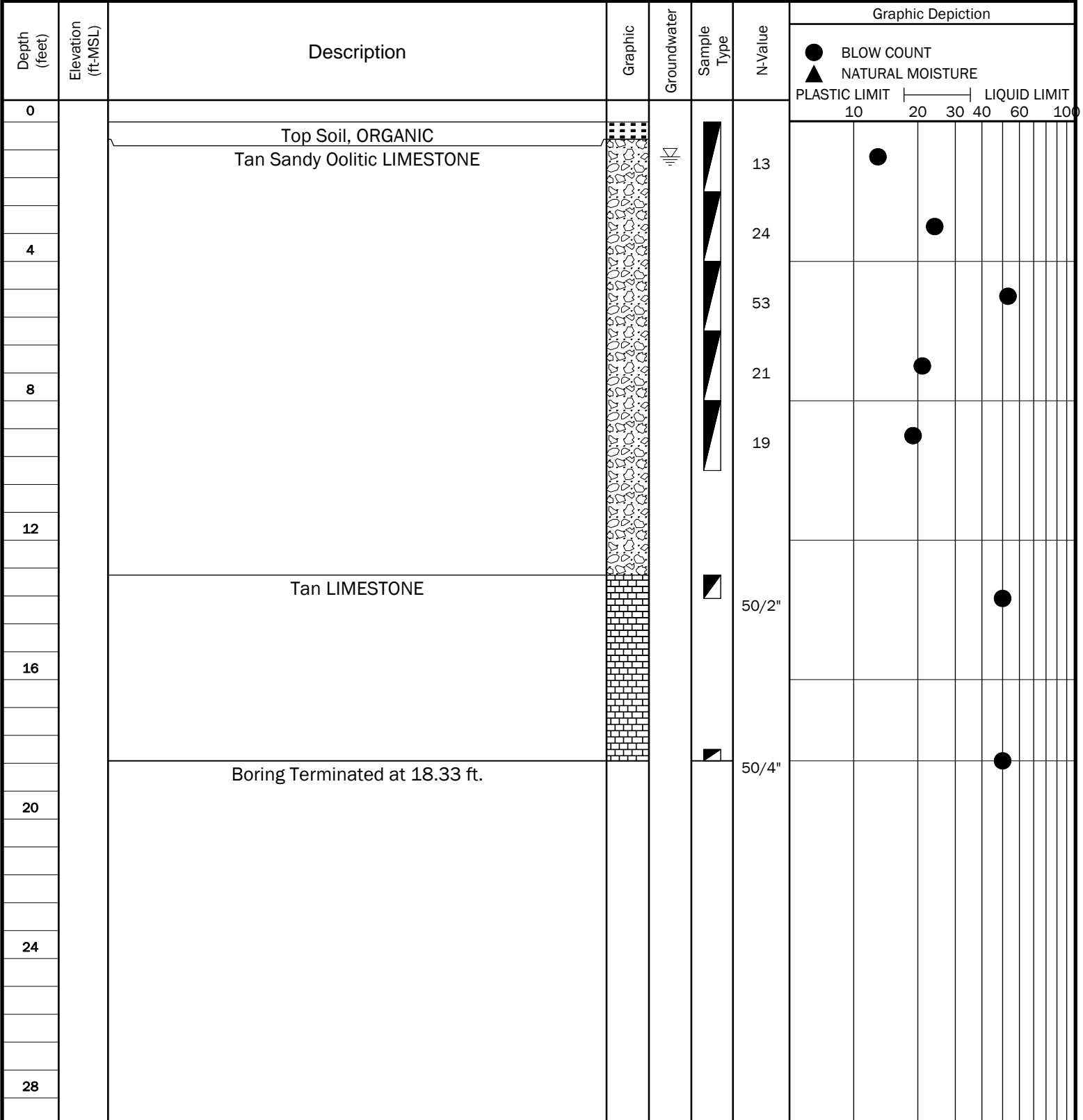
PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 11/01/17  
DEPTH TO - WATER> INITIAL: 0'0" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0																
		Tan Sandy Oolitic LIMESTONE				19										
						23										
4						25										
						19										
8						24										
12																
		Tan LIMESTONE				50/4"										
16																
20		Boring Terminated at 18.92 ft.				50/5"										
24																
28																



# TEST BORING RECORD B56

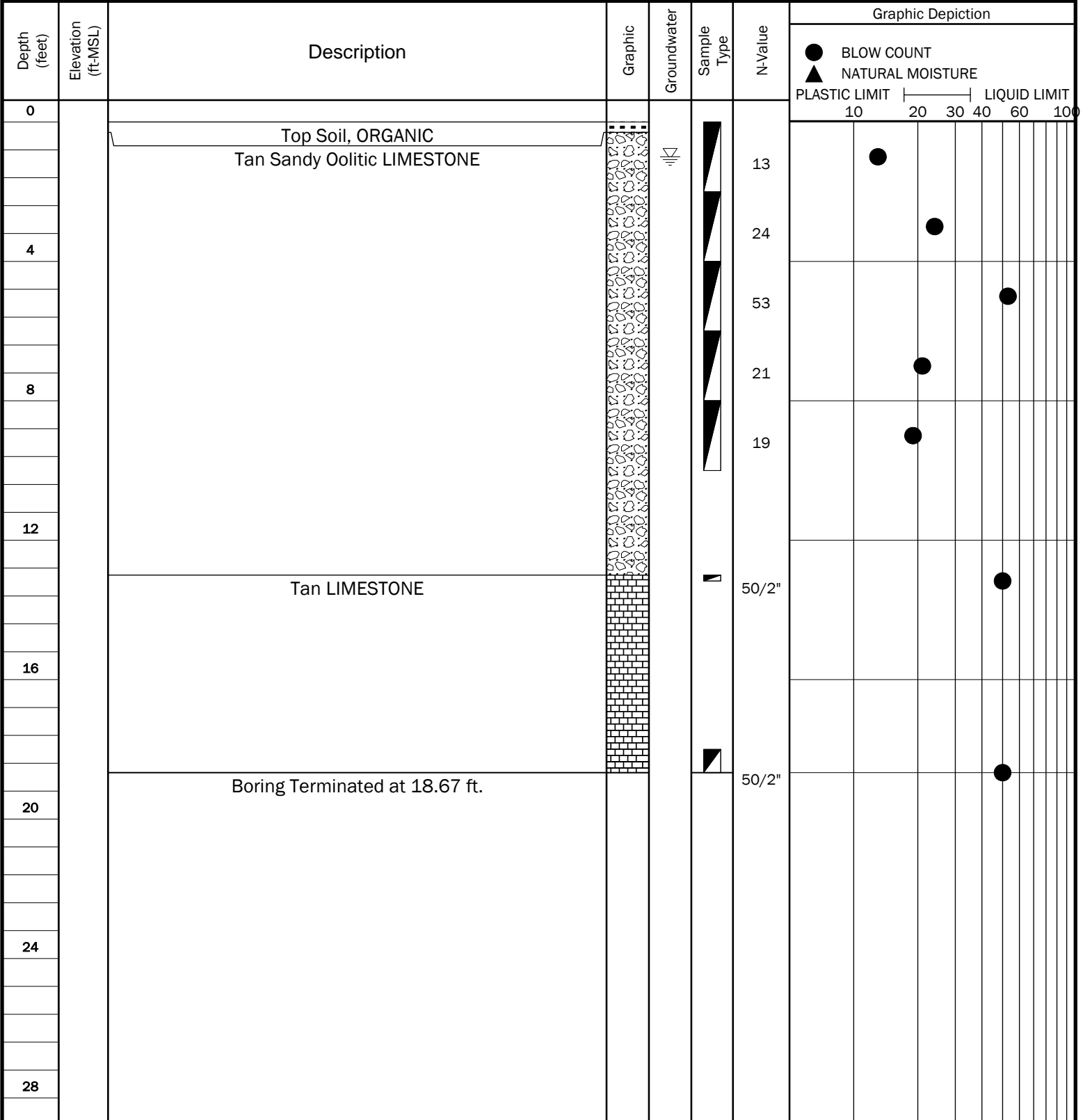
PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/23/17  
DEPTH TO - WATER> INITIAL: 1'8" AFTER 24 HOURS: N/A CAVING> C





# TEST BORING RECORD B57

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/23/17  
DEPTH TO - WATER> INITIAL: 1'8" AFTER 24 HOURS: N/A CAVING> C



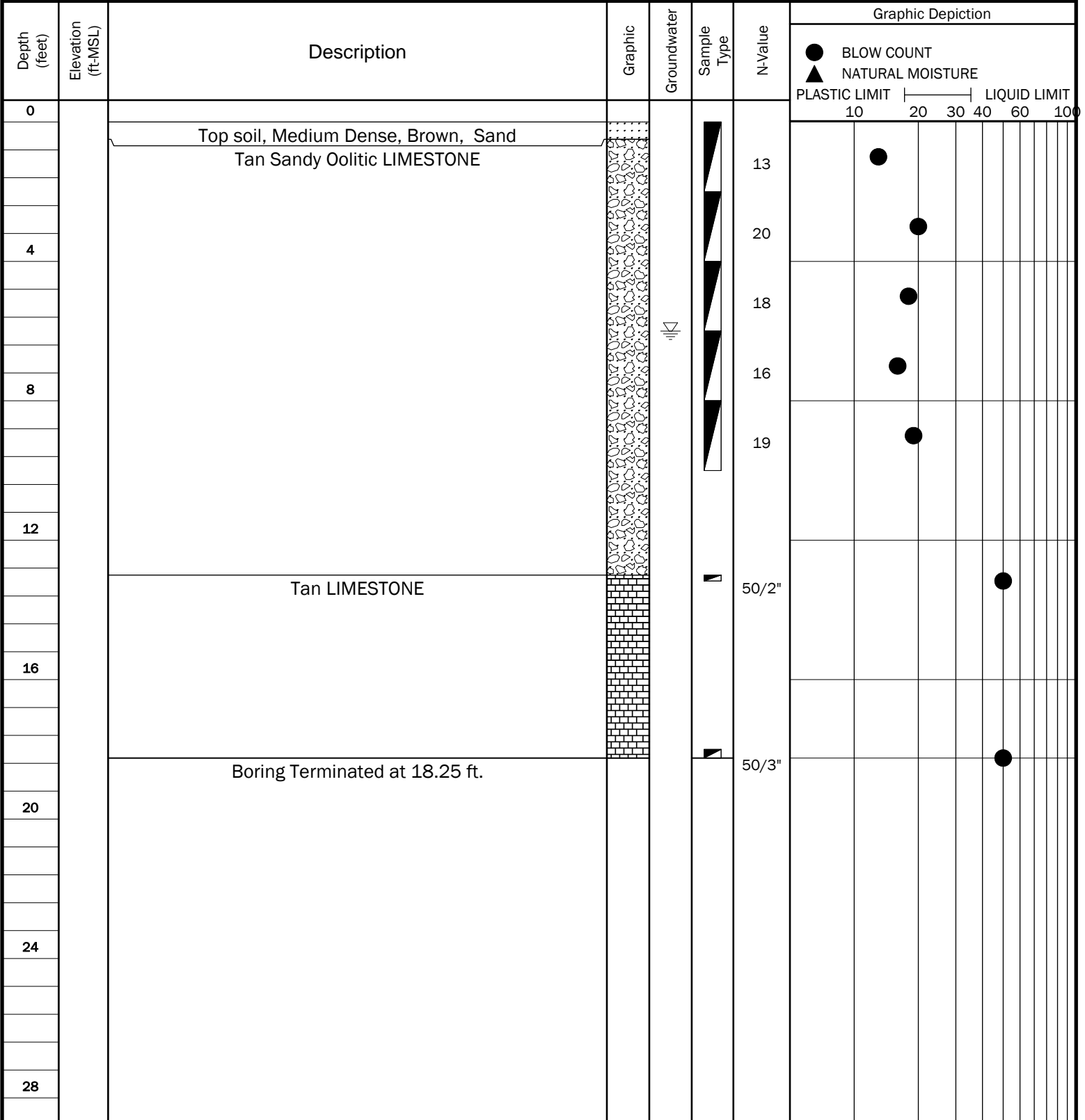




# TEST BORING RECORD B58

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/27/17  
DEPTH TO - WATER> INITIAL: 6" AFTER 24 HOURS: N/A CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

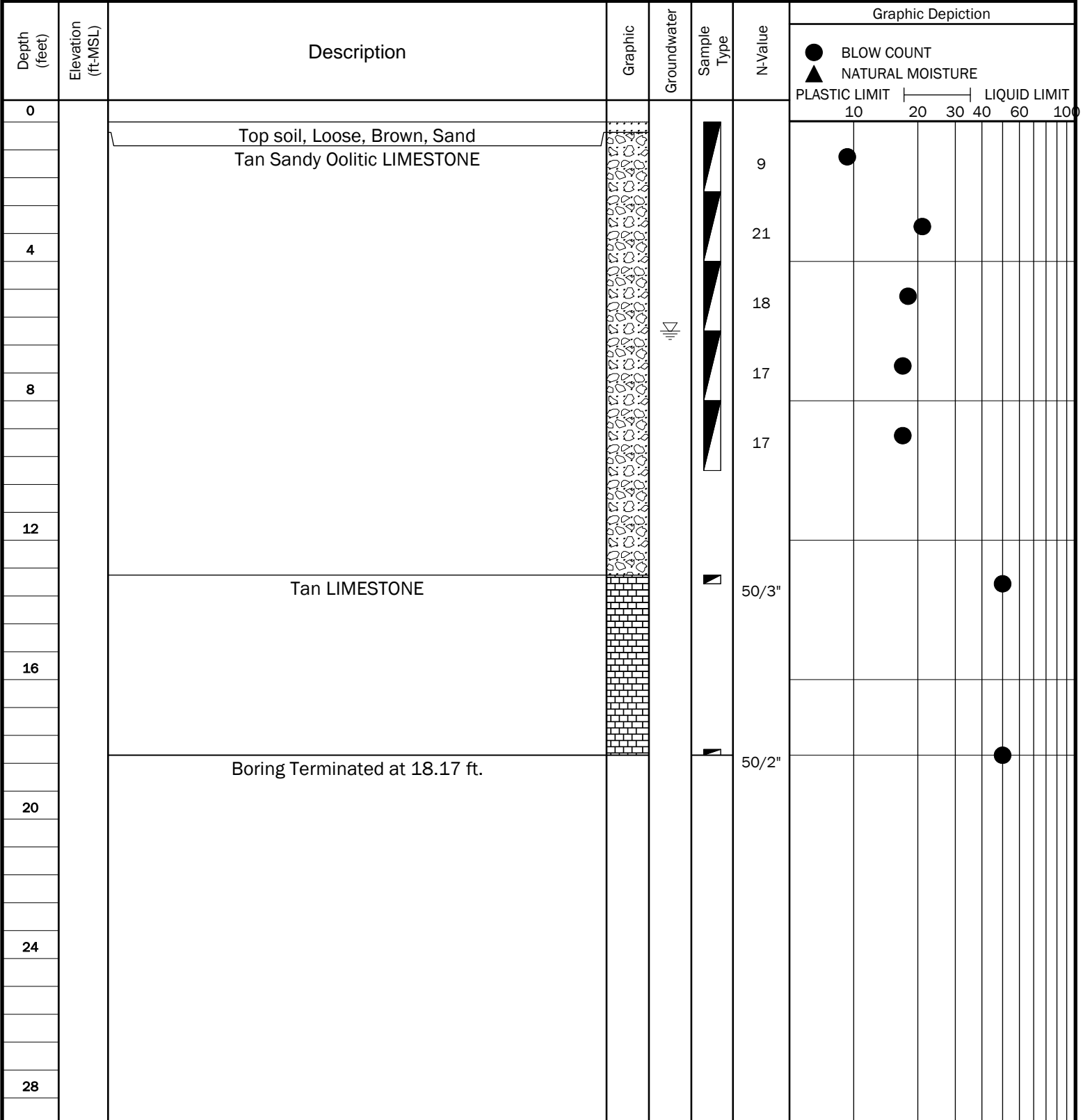




# TEST BORING RECORD B59

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/27/17  
DEPTH TO - WATER> INITIAL: 6" AFTER 24 HOURS: N/A CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

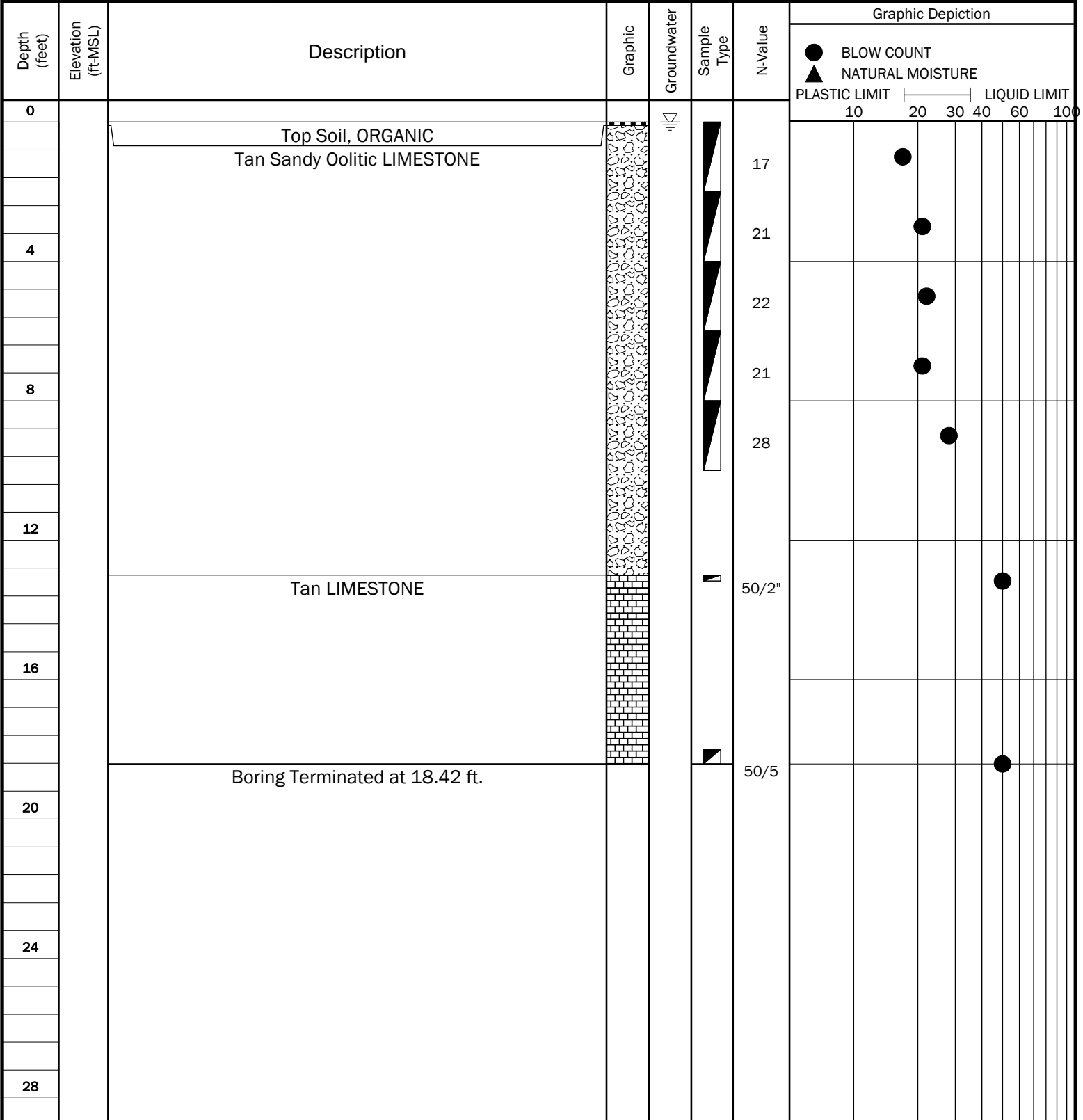




# TEST BORING RECORD B60

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 11/01/17  
DEPTH TO - WATER> INITIAL: 0'0" AFTER 24 HOURS: N/A CAVING> C

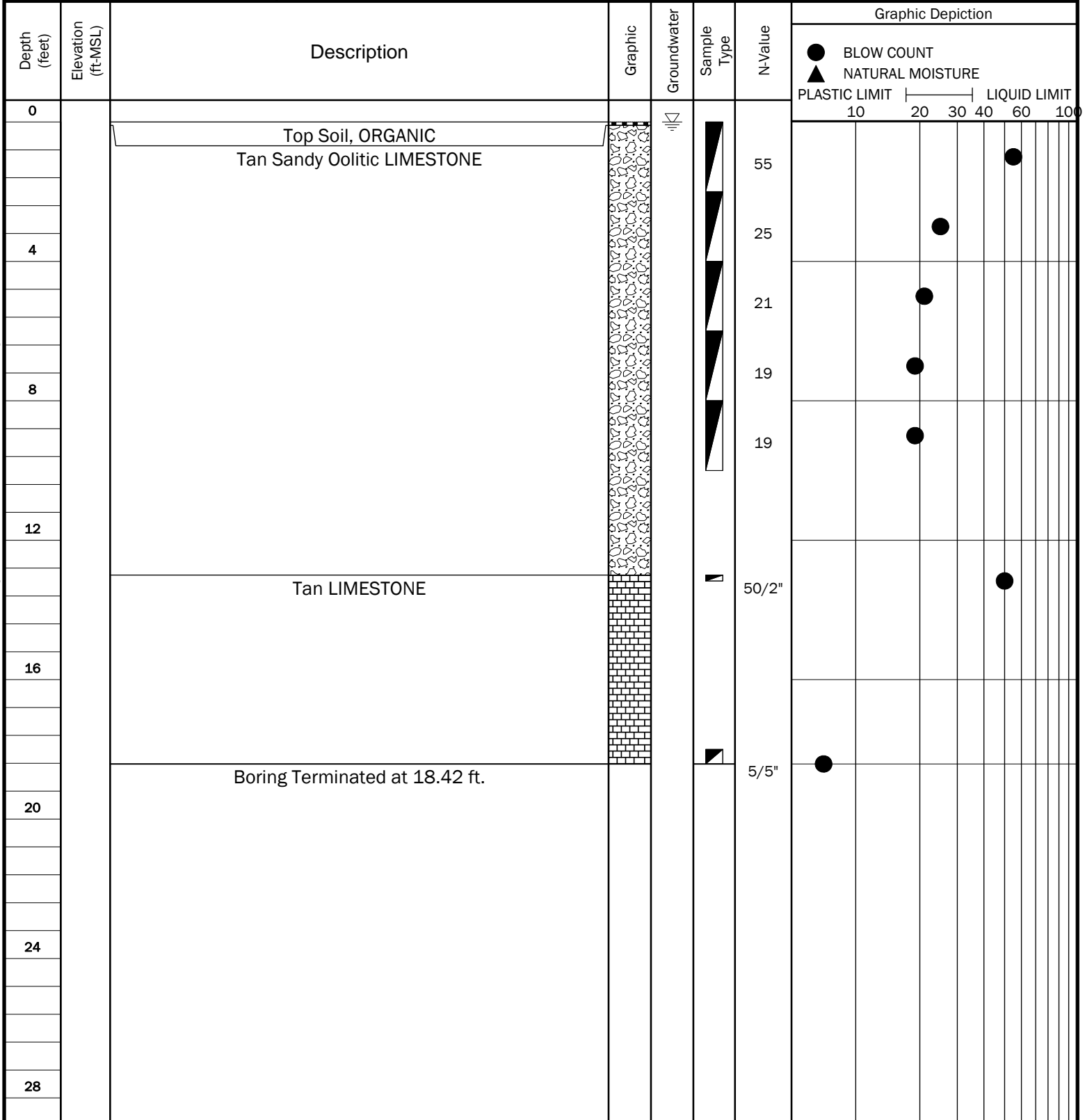
This information pertains only to this boring and should not be interpreted as being indicative of the site.





# TEST BORING RECORD B61

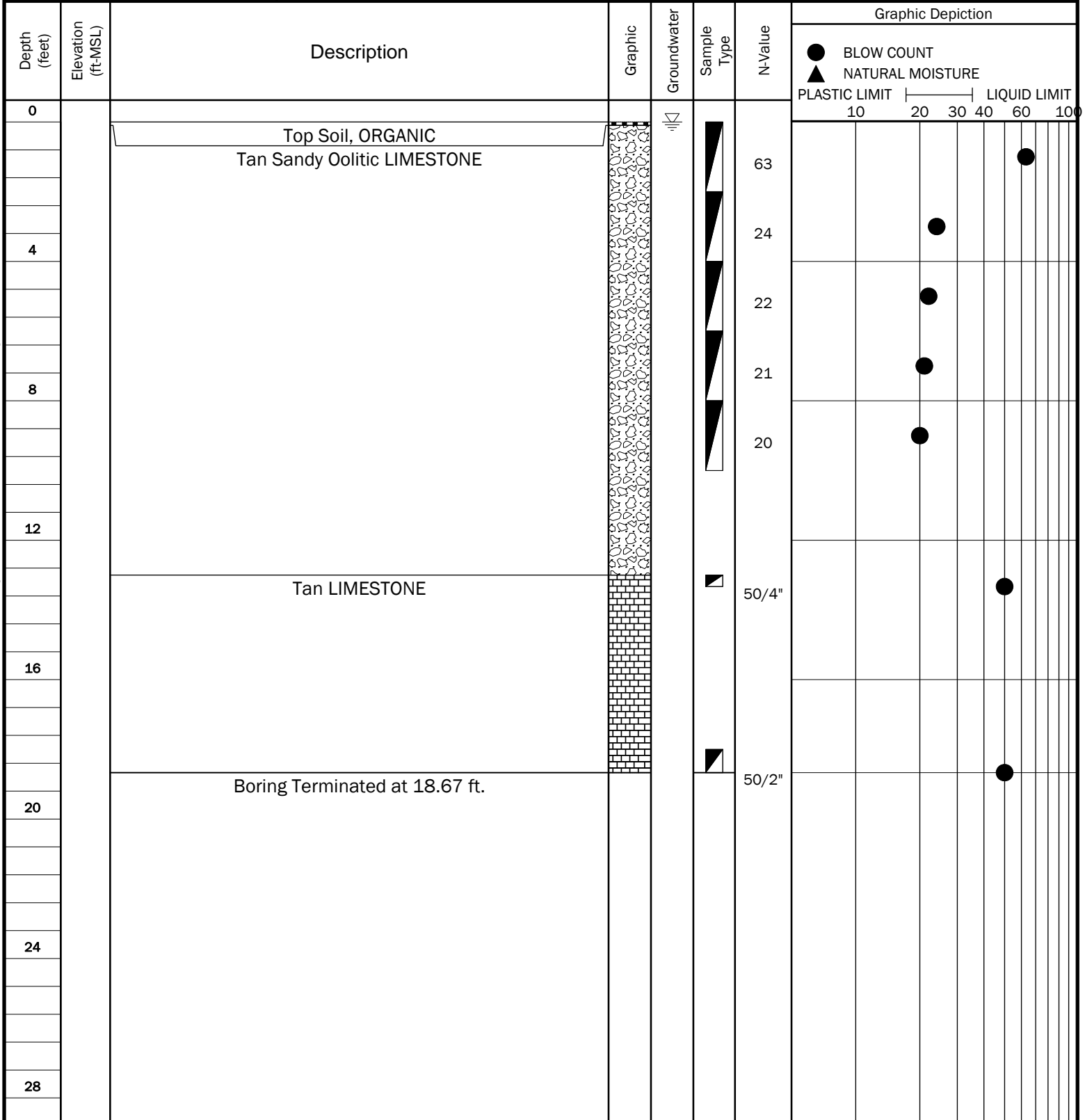
PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 11/01/17  
DEPTH TO - WATER> INITIAL: 0'0" AFTER 24 HOURS: N/A CAVING> C





# TEST BORING RECORD B62

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 11/01/17  
DEPTH TO - WATER> INITIAL: 0'0" AFTER 24 HOURS: N/A CAVING> C





# TEST BORING RECORD B63

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/27/17  
DEPTH TO - WATER> INITIAL: 1'4" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				24										
						26										
4						21										
						21										
8						17										
12		Tan LIMESTONE				50/4"										
16																
		Boring Terminated at 18.25 ft.				50/3"										
20																
24																
28																



# TEST BORING RECORD B64

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/27/17  
DEPTH TO - WATER> INITIAL: 1'8" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div><div>● BLOW COUNT</div><div>▲ NATURAL MOISTURE</div><div>PLASTIC LIMIT   LIQUID LIMIT</div><div>10 20 30 40 60 100</div></div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				26										
						17										
4						13										
						8										
8						11										
12																
		Tan LIMESTONE				50/3"										
16																
20		Boring Terminated at 18.83 ft.				50/4"										
24																
28																



# TEST BORING RECORD B65

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/27/17  
DEPTH TO - WATER> INITIAL: 4" AFTER 24 HOURS: N/A CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							● BLOW COUNT	▲ NATURAL MOISTURE	PLASTIC LIMIT		LIQUID LIMIT					
0		Top Soil, Medium Dense, Brown, Sand							10	20	30	40	60	100		
		Tan Sandy Oolitic LIMESTONE				13										
						7										
4						18										
						16										
8						15										
12																
		Tan LIMESTONE				50/3"										
16																
20		Boring Terminated at 18.58 ft.				50/1"										
24																
28																

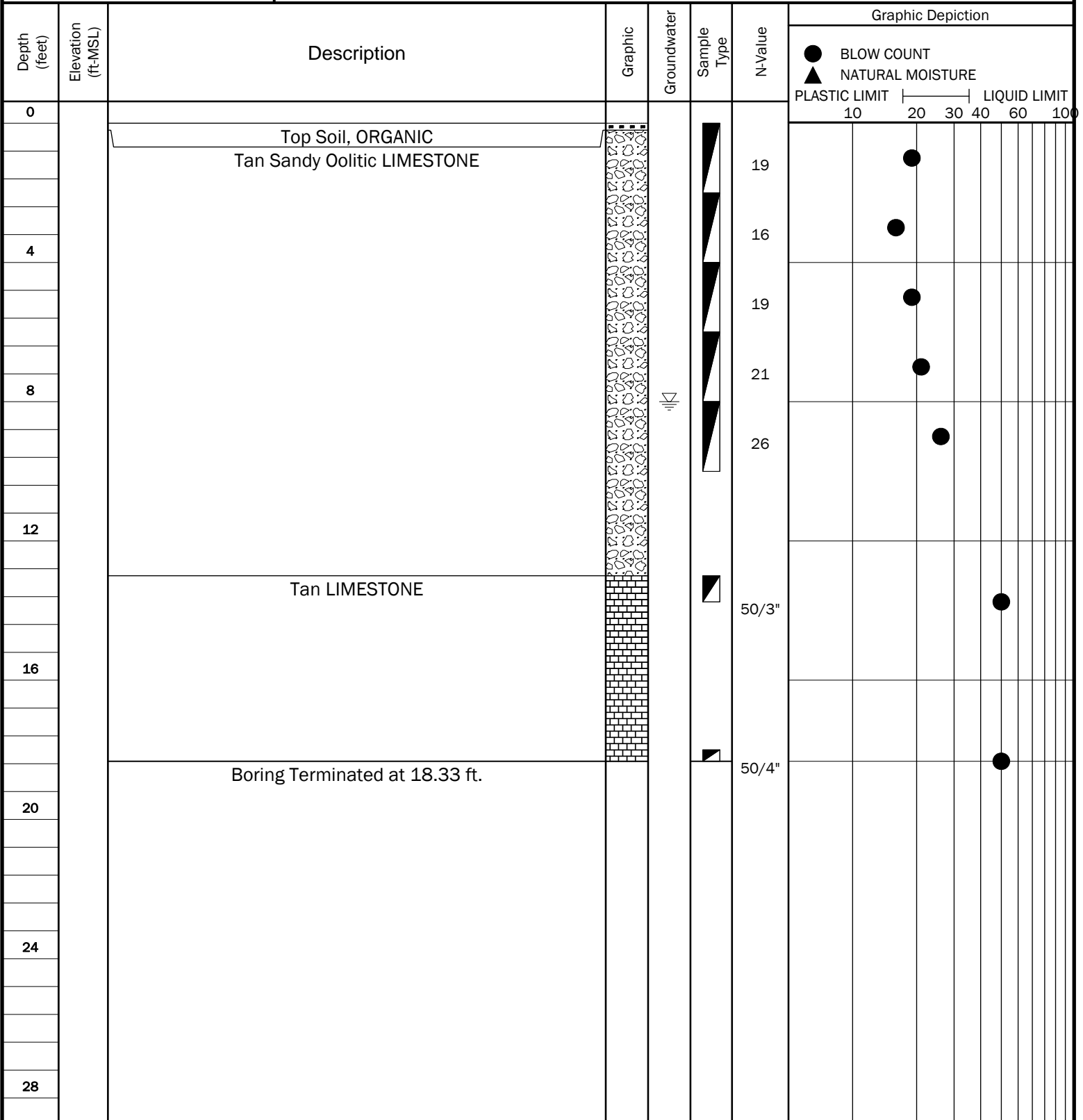




# TEST BORING RECORD B66

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/30/17  
DEPTH TO - WATER> INITIAL: 8" AFTER 24 HOURS: N/A CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.





# TEST BORING RECORD B67

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/30/17  
DEPTH TO - WATER> INITIAL: 8" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				15										
						16										
4						18										
						21										
8						26										
12																
		Tan LIMESTONE				50/4"										
16																
						50/5"										
20		Boring Terminated at 18.42 ft.														
24																
28																



# TEST BORING RECORD B68

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/27/17  
DEPTH TO - WATER> INITIAL: 1" AFTER 24 HOURS: N/A CAVING> C

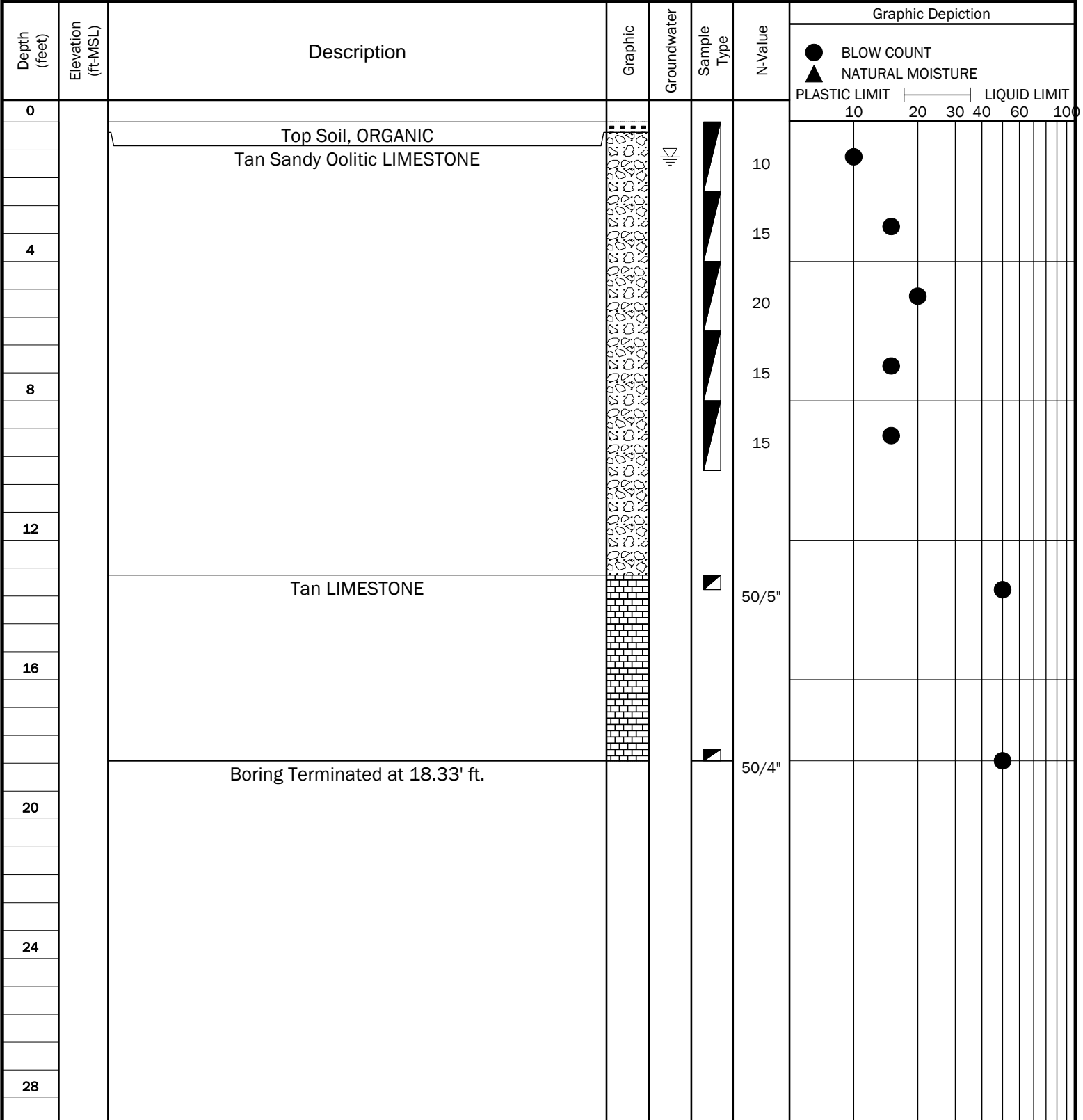
This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top soil, Loose, Brown, Sand														
		Tan Sandy Oolitic LIMESTONE				9										
						15										
4						20										
						15										
8						15										
12		Tan LIMESTONE				50/4"										
16																
						68										
20		Boring Terminated at 20' ft.														
24																
28																



# TEST BORING RECORD B69

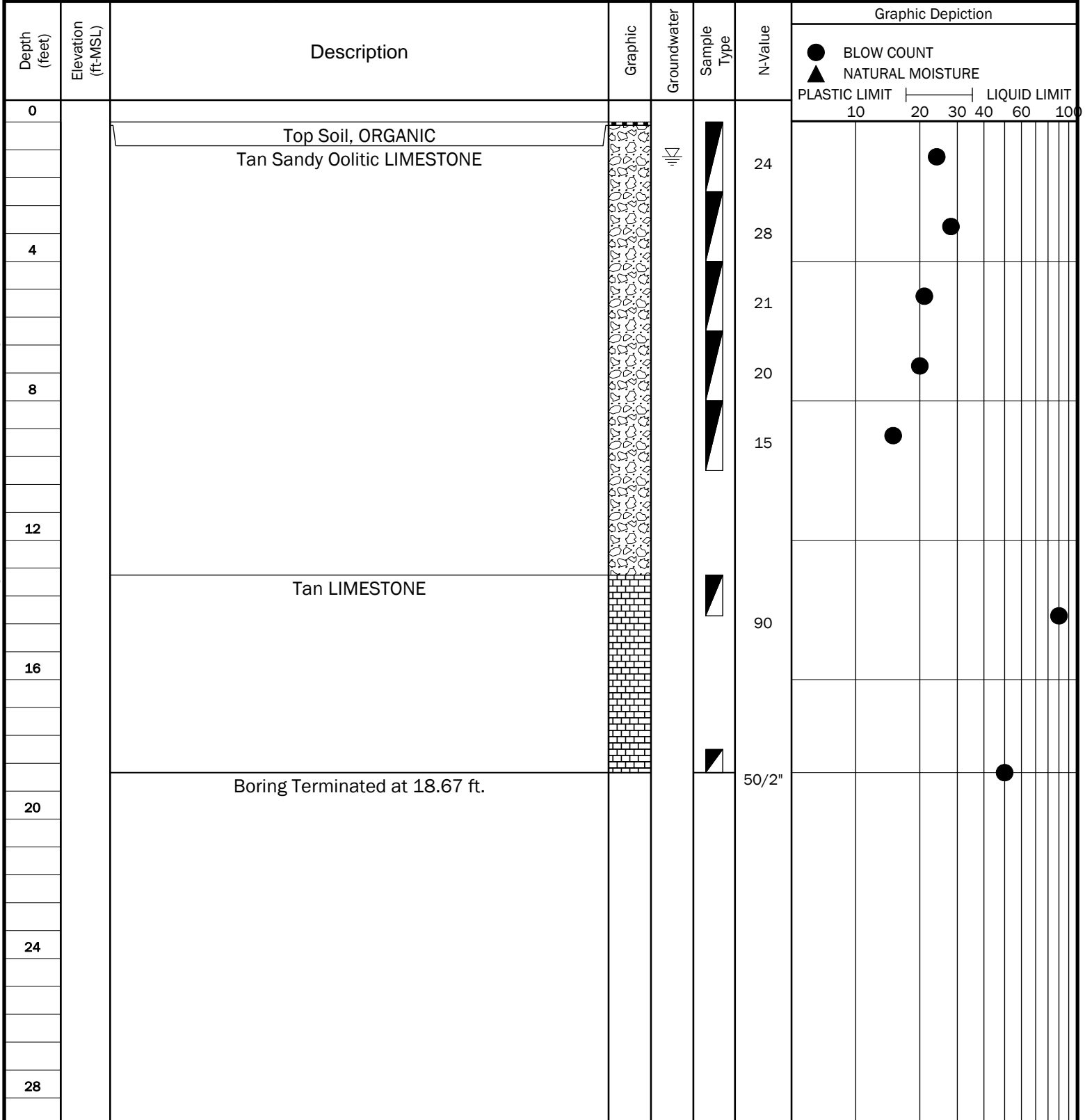
PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/27/17  
DEPTH TO - WATER> INITIAL: 1" AFTER 24 HOURS: N/A CAVING> C





# TEST BORING RECORD B70

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/27/17  
DEPTH TO - WATER> INITIAL: 1'3" AFTER 24 HOURS: N/A CAVING> C





# TEST BORING RECORD B71

PROJECT: Home Depot Geo Project

PROJECT NO.: 10101-2017021

CLIENT: Home Depot

PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL

LOCATION: See Boring Location Map

ELEVATION: N/A

DRILLER: J & R Precision Drilling, Inc

LOGGED BY: YV

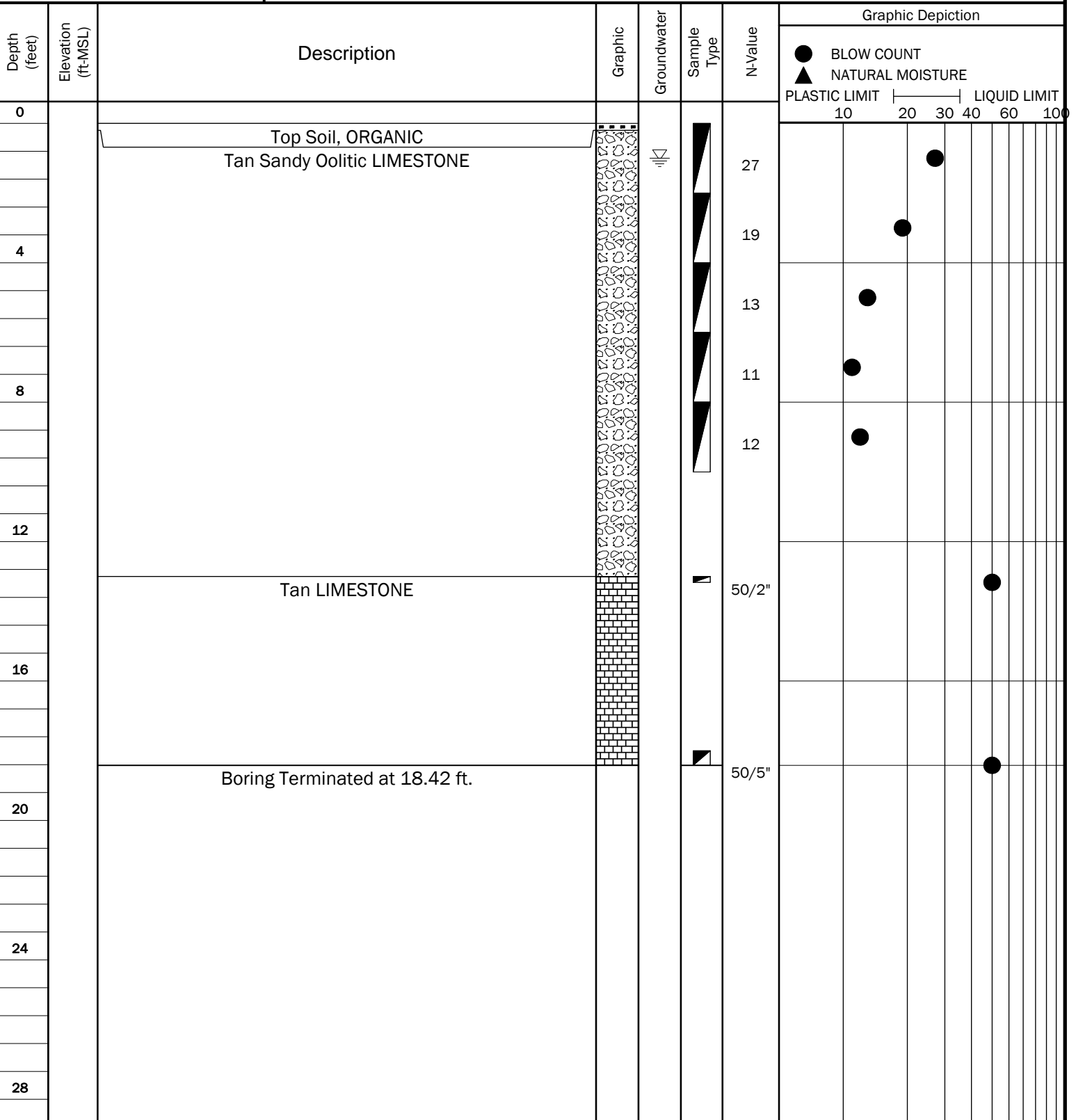
DRILLING METHOD: Rotary Wash

DATE: 10/30/17

DEPTH TO - WATER> INITIAL: 1'8"

AFTER 24 HOURS: N/A

CAVING> C





# TEST BORING RECORD B72

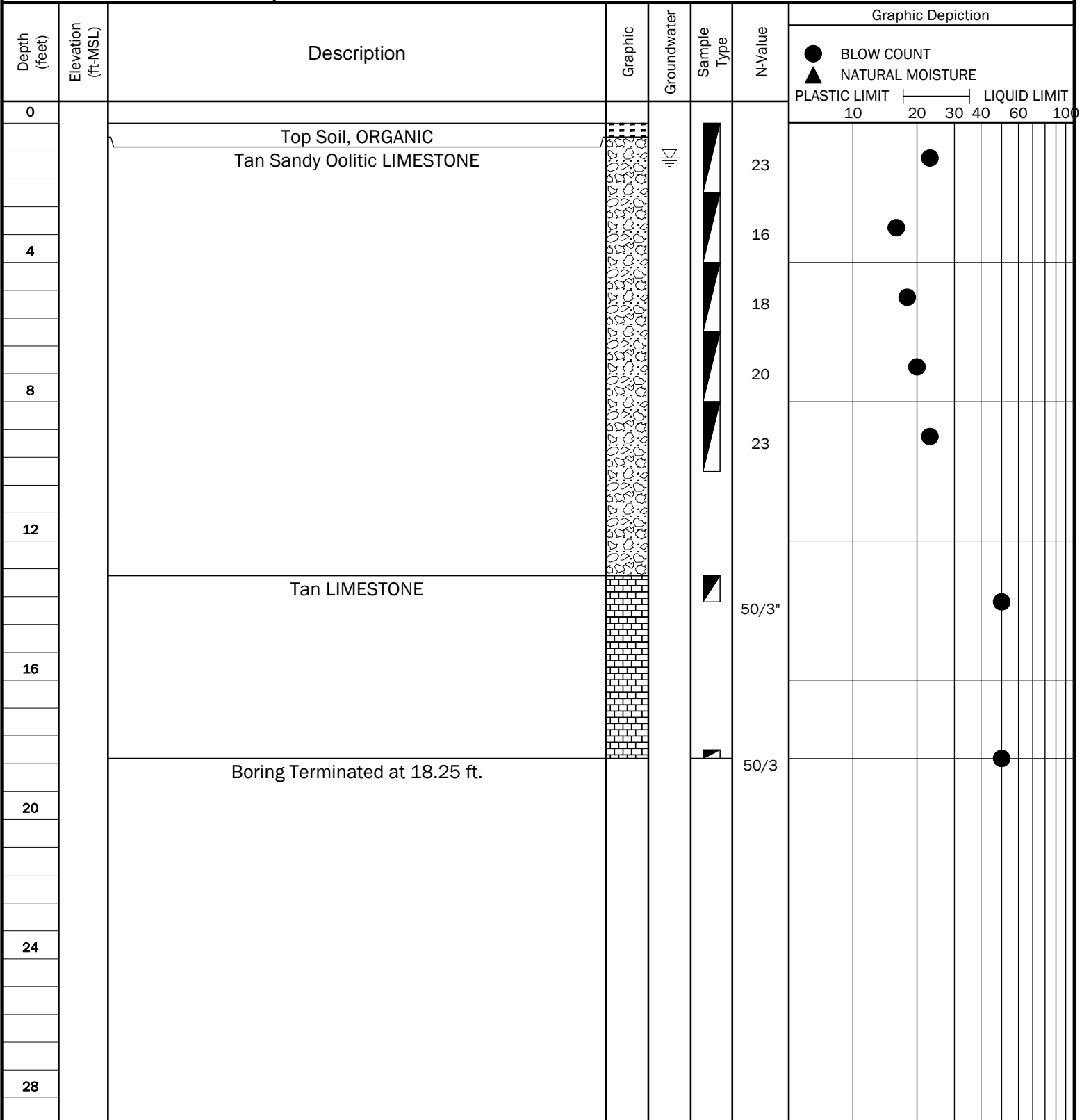
PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/27/17  
DEPTH TO - WATER> INITIAL: 6" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, Very Loose, Brown Sand														
		Tan Sandy Oolitic LIMESTONE				4	●									
						4	●									
4						17		●								
						14		●								
8						14		●								
12																
		Tan LIMESTONE				5/4"	●									
16																
20		Boring Terminated at 18.67 ft.				50/2"							●			
24																
28																



# TEST BORING RECORD B73

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/23/17  
DEPTH TO - WATER> INITIAL: 1'4" AFTER 24 HOURS: N/A CAVING> C



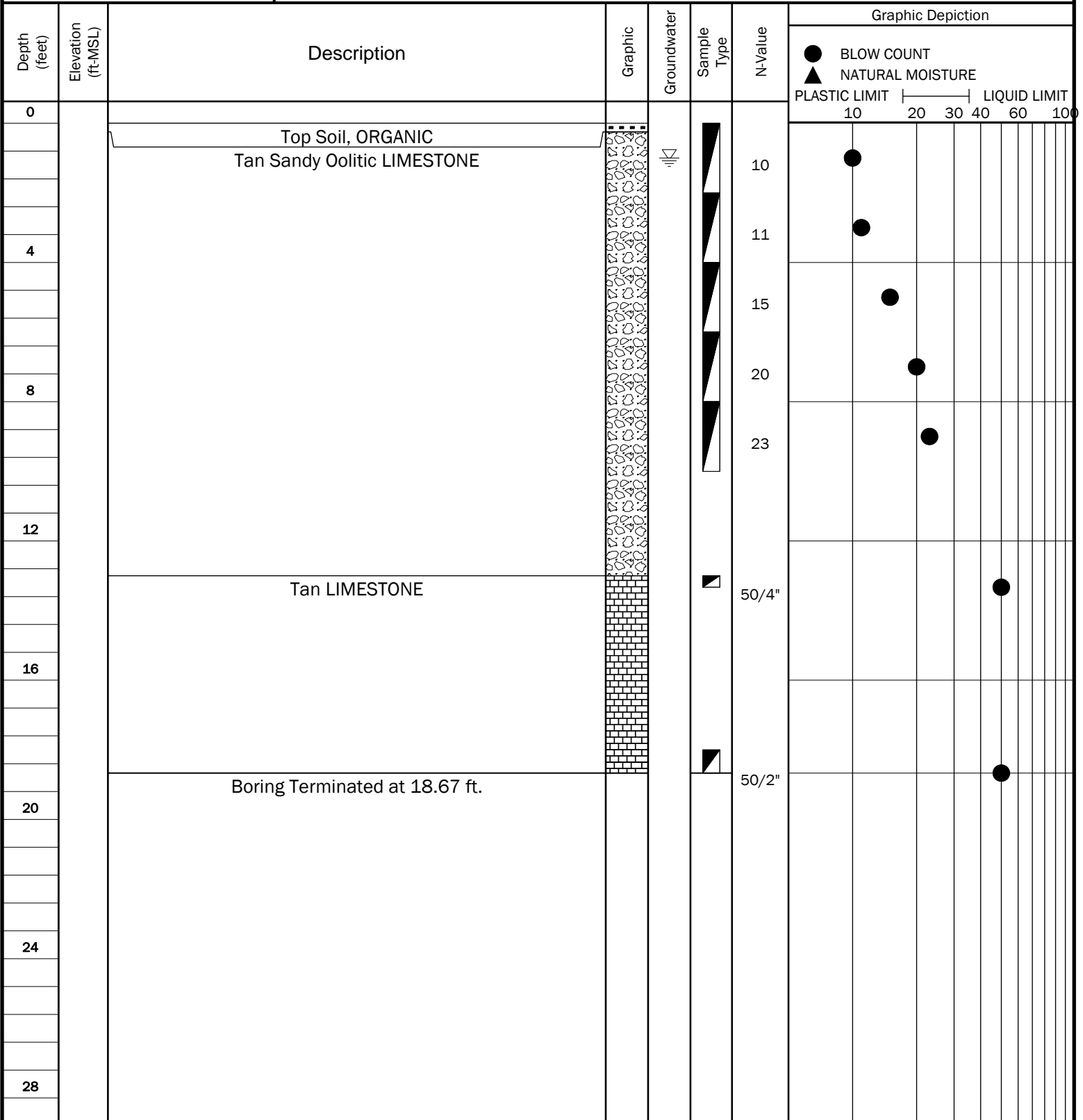




# TEST BORING RECORD B74

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/23/17  
DEPTH TO - WATER> INITIAL: 1'4" AFTER 24 HOURS: N/A CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.





# TEST BORING RECORD B75

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/23/17  
DEPTH TO - WATER> INITIAL: 1'2" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				26										
						38										
4						27										
						26										
8						28										
12																
		Tan LIMESTONE				50/3"										
16																
20		Boring Terminated at 18.17 ft.				50/2"										
24																
28																



# TEST BORING RECORD B76

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/23/17  
DEPTH TO - WATER> INITIAL: 1'2" AFTER 24 HOURS: N/A CAVING> C

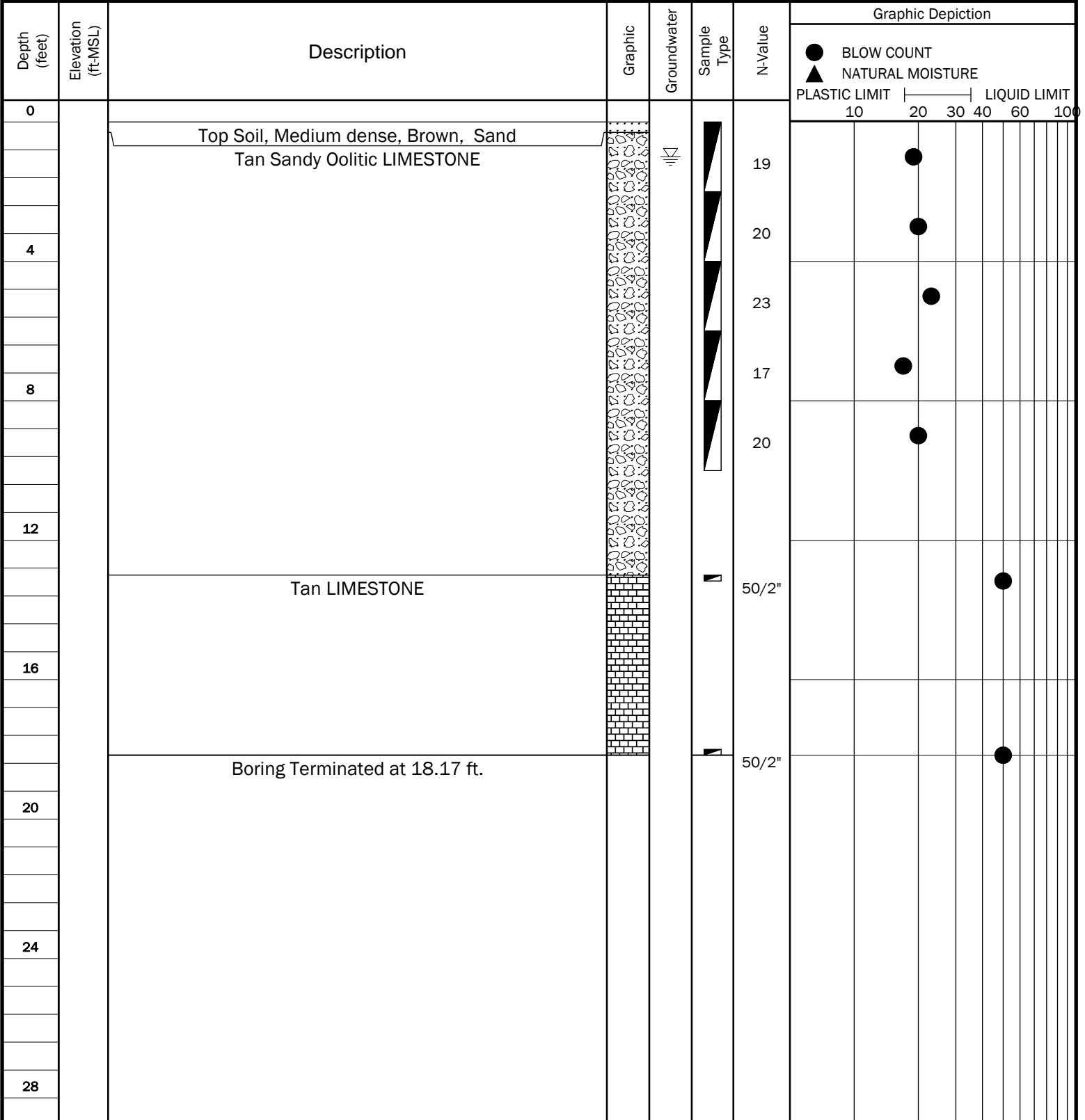
Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				18										
						19										
4						18										
						19										
8						23										
12																
		Tan LIMESTONE				50/4"										
16																
						50/3"										
20		Boring Terminated at 18.25 ft.														
24																
28																



# TEST BORING RECORD B77

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/24/17  
DEPTH TO - WATER> INITIAL: 1'10" AFTER 24 HOURS: N/A CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.





# TEST BORING RECORD B78

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/23/17  
DEPTH TO - WATER> INITIAL: 1'9" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div><div>● BLOW COUNT</div><div>▲ NATURAL MOISTURE</div><div>PLASTIC LIMIT   LIQUID LIMIT</div><div>10 20 30 40 60 100</div></div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				7										
						34										
4						7										
						8										
8						8										
12																
		Tan LIMESTONE				50/8"										
16																
		Boring Terminated at 18.17 ft.				50/2"										
20																
24																
28																



# TEST BORING RECORD B79

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/23/17  
DEPTH TO - WATER> INITIAL: 1'9" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				12										
						33										
4						13										
						14										
8						11										
12																
		Tan LIMESTONE				50/3"										
16																
20		Boring Terminated at 18.58 ft.				50/1"										
24																
28																



# TEST BORING RECORD B80

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/24/17  
DEPTH TO - WATER> INITIAL: 2'0" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT 10 20 30 40 60 100 LIQUID LIMIT</div>									
0		Top Soil, ORGANIC														
		Tan Sand Oolitic LIMESTONE				8										
						11										
4						19										
						22										
8						22										
12		Tan LIMESTONE				50/3"										
16																
20		Boring Terminated at 18.58 ft.				50/1"										
24																
28																



# TEST BORING RECORD B81

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/24/17  
DEPTH TO - WATER> INITIAL: 2'0" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				14										
						17										
4						25										
						22										
8						21										
12		Tan LIMESTONE				50/4"										
16																
		Boring Terminated at 18.25 ft.				50/3"										
20																
24																
28																





# TEST BORING RECORD B82

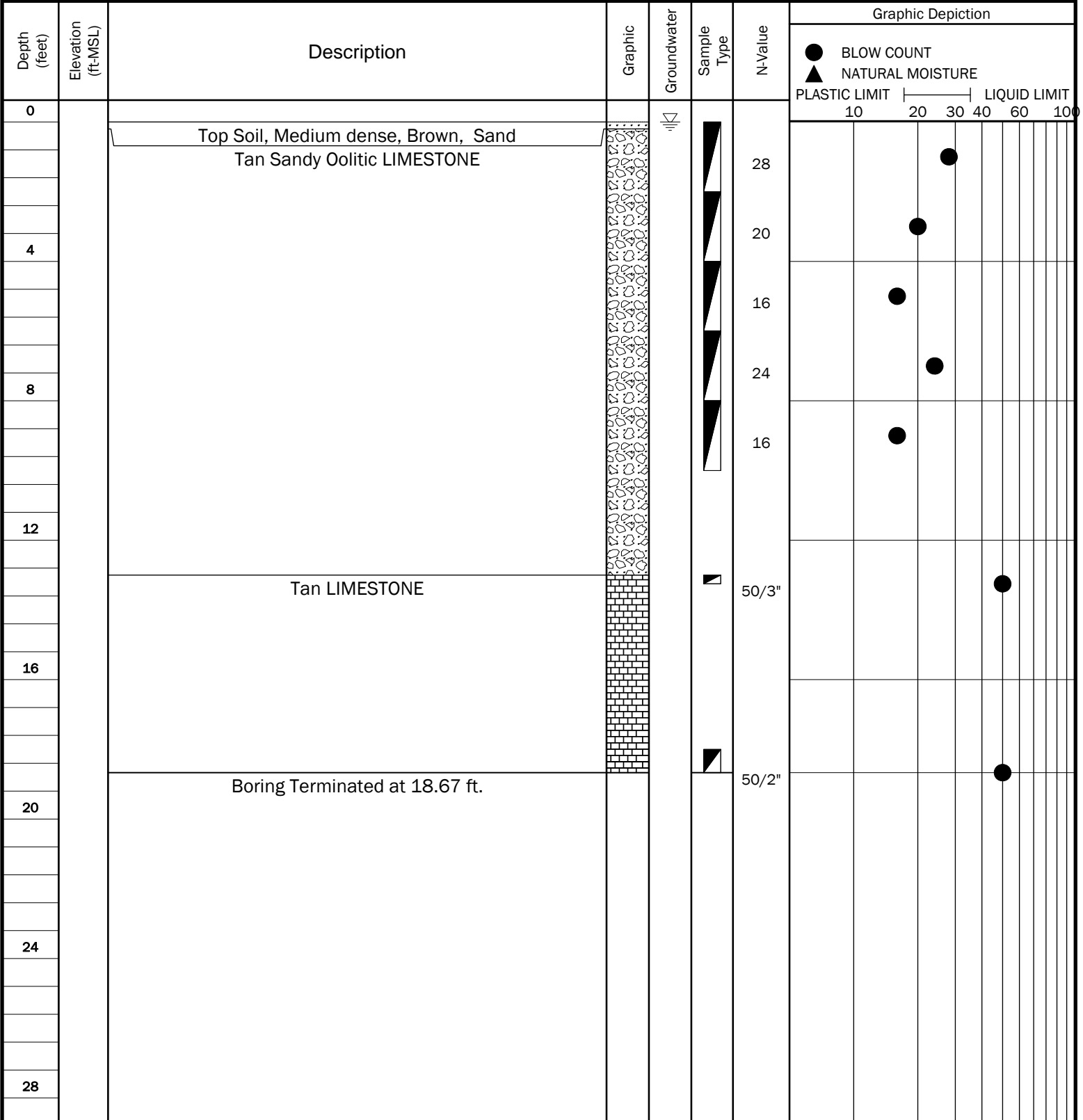
PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/30/17  
DEPTH TO - WATER> INITIAL: 0'0" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div><div>● BLOW COUNT</div><div>▲ NATURAL MOISTURE</div><div>PLASTIC LIMIT   LIQUID LIMIT</div><div>10 20 30 40 60 100</div></div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				19										
						19										
4						15										
						15										
8						25										
12																
		Tan LIMESTONE				50/3"										
16																
						50/4"										
20		Boring Terminated at 18.33 ft.														
24																
28																



# TEST BORING RECORD B83

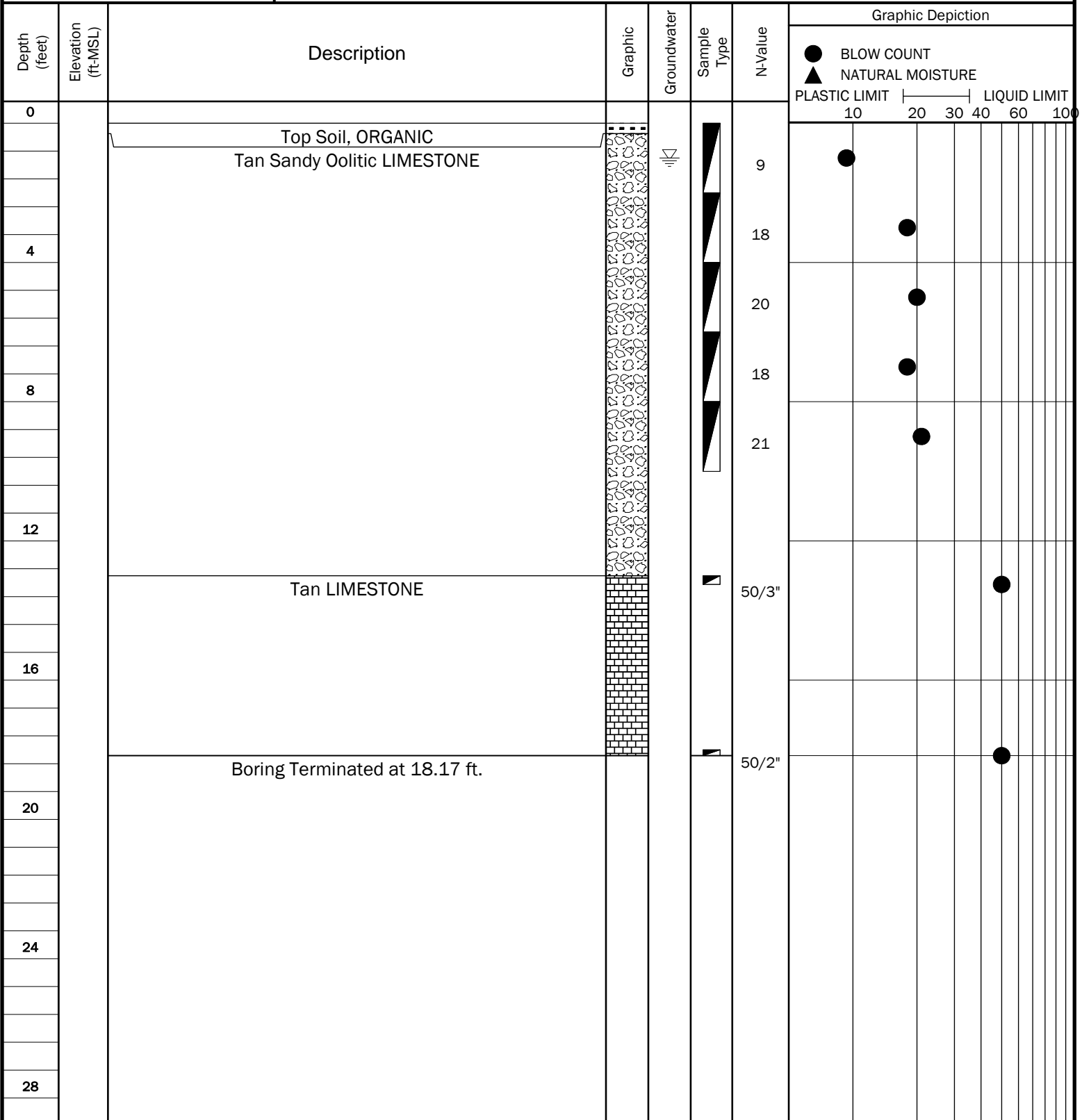
PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 11/01/17  
DEPTH TO - WATER> INITIAL: 0'0" AFTER 24 HOURS: N/A CAVING> C





# TEST BORING RECORD B84

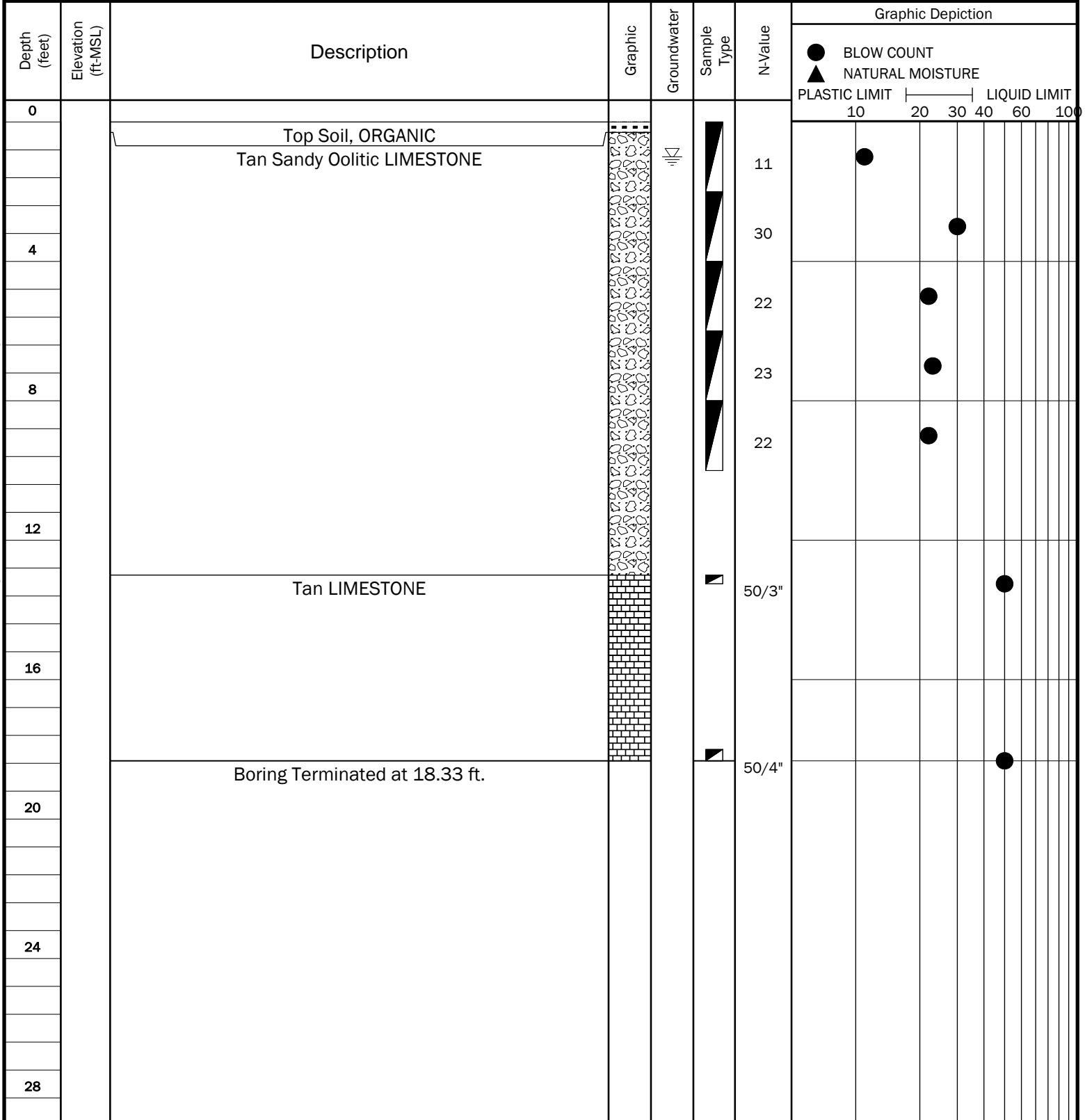
PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/24/17  
DEPTH TO - WATER> INITIAL: 1'10" AFTER 24 HOURS: N/A CAVING> C





# TEST BORING RECORD B85

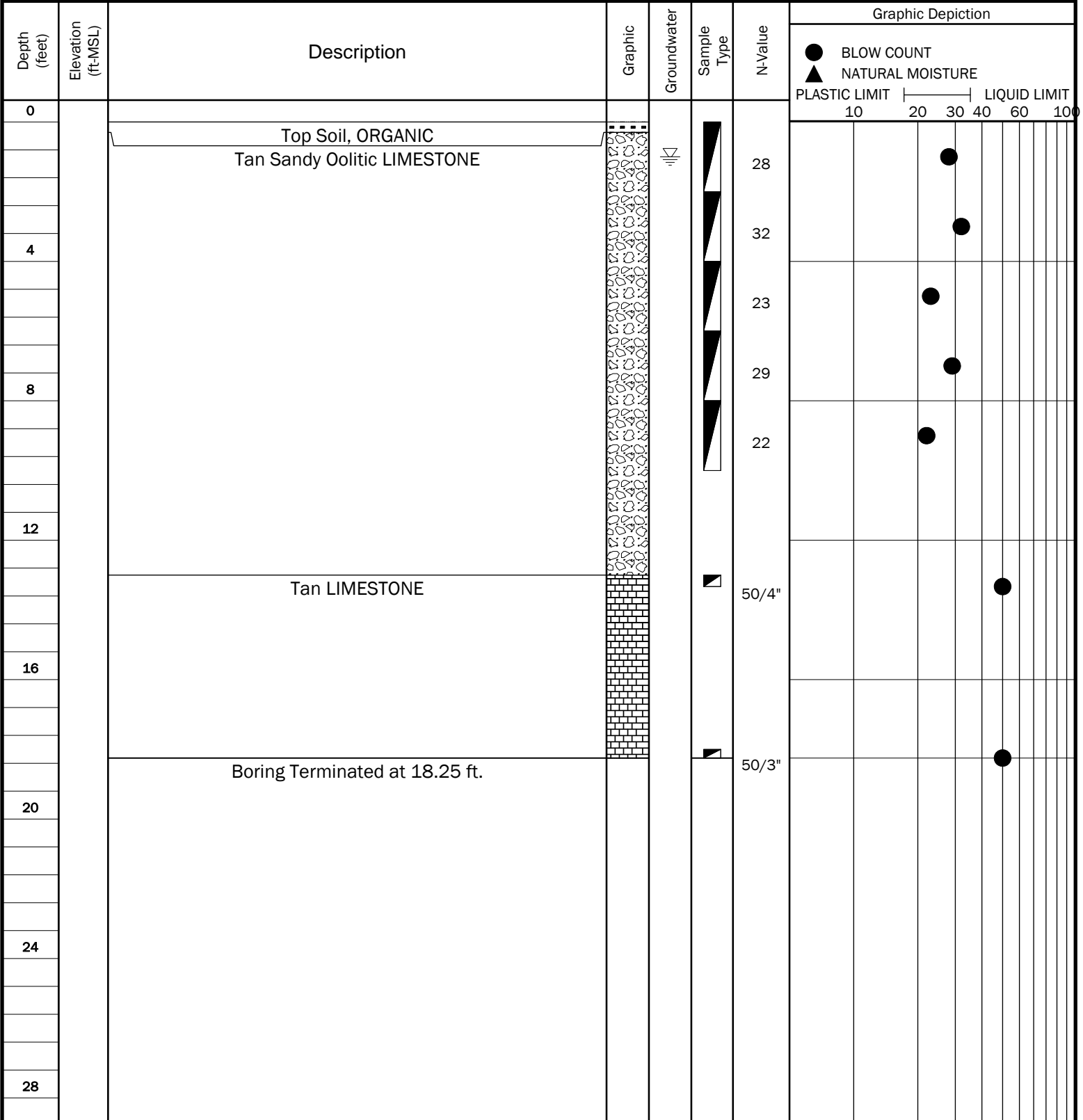
PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/24/17  
DEPTH TO - WATER> INITIAL: 1'10" AFTER 24 HOURS: N/A CAVING> C





# TEST BORING RECORD B86

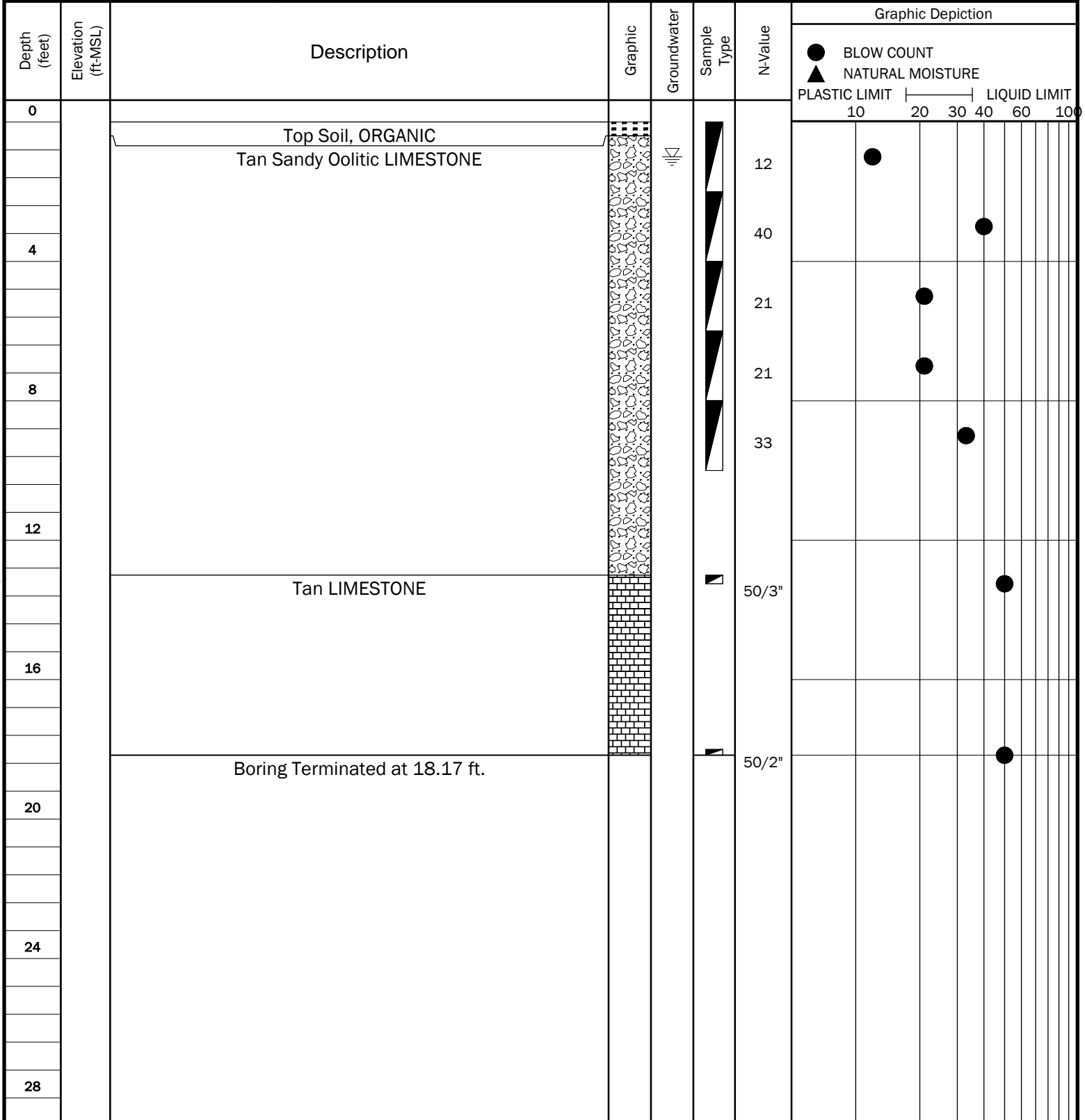
PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/25/17  
DEPTH TO - WATER> INITIAL: 1'10" AFTER 24 HOURS: N/A CAVING> C





# TEST BORING RECORD B87

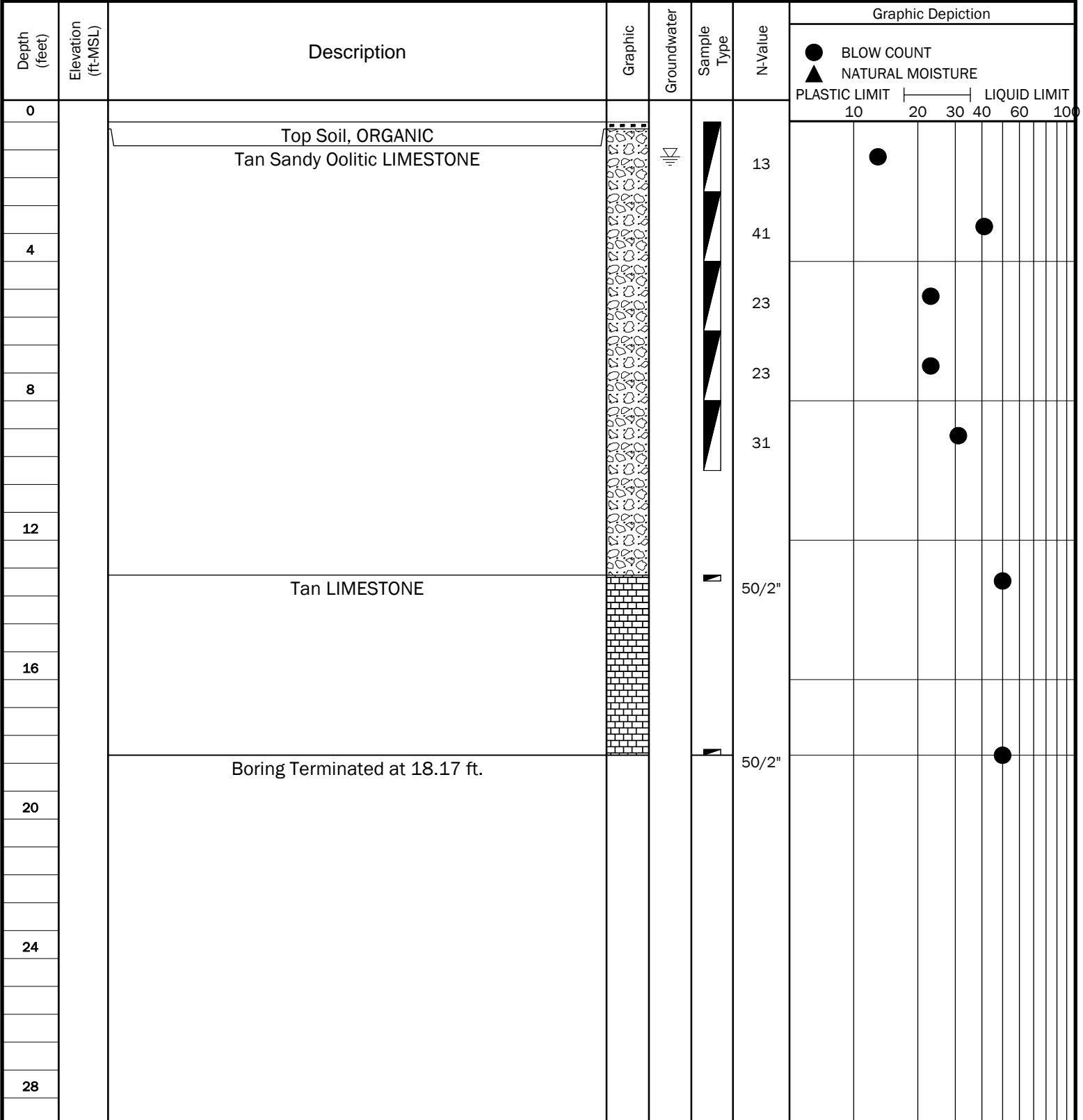
PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/24/17  
DEPTH TO - WATER> INITIAL: 1'2" AFTER 24 HOURS: N/A CAVING> C





# TEST BORING RECORD B88

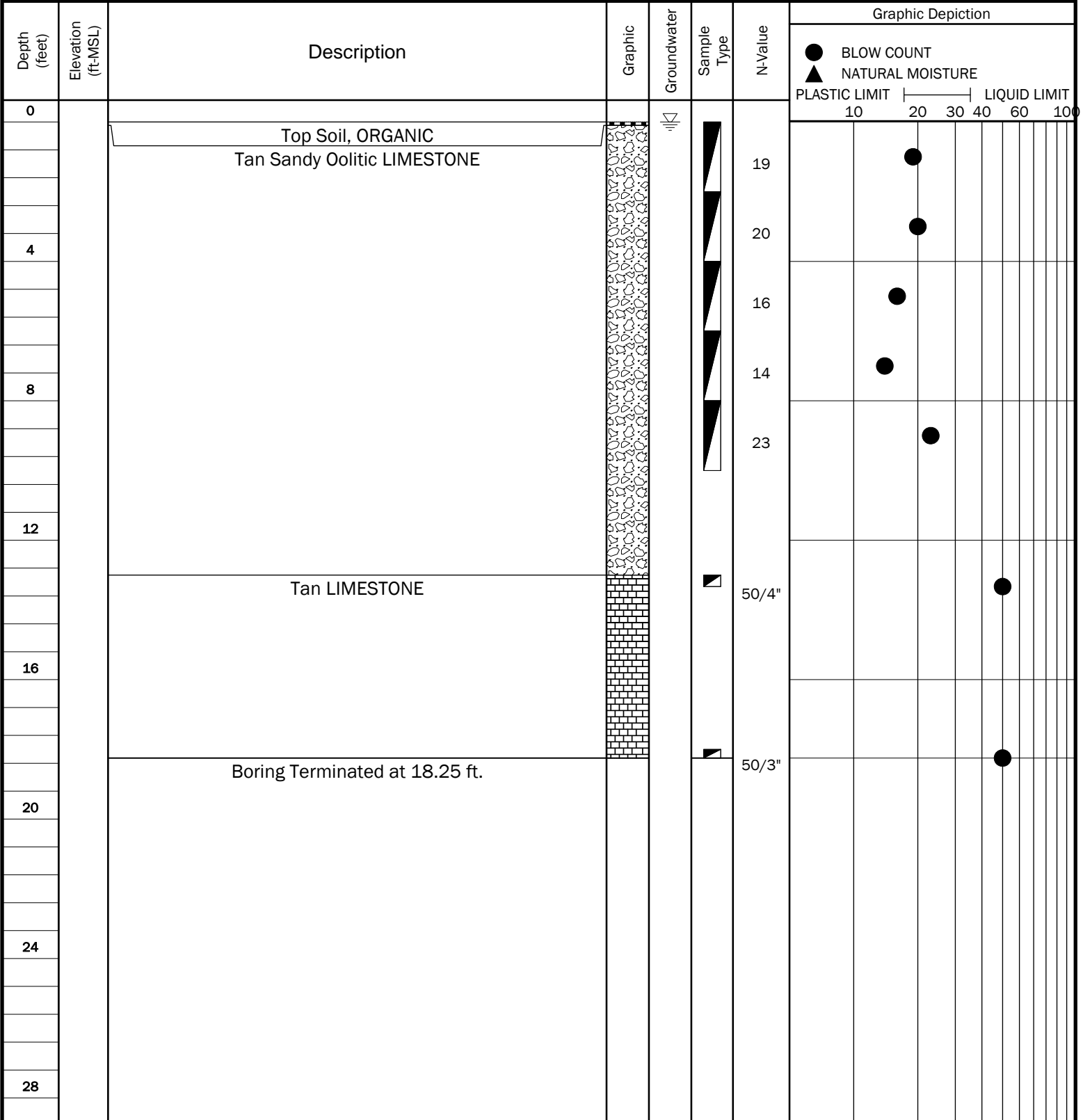
PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/24/17  
DEPTH TO - WATER> INITIAL: 1'2" AFTER 24 HOURS: N/A CAVING> C





# TEST BORING RECORD B89

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/30/17  
DEPTH TO - WATER> INITIAL: 0'0" AFTER 24 HOURS: N/A CAVING> C

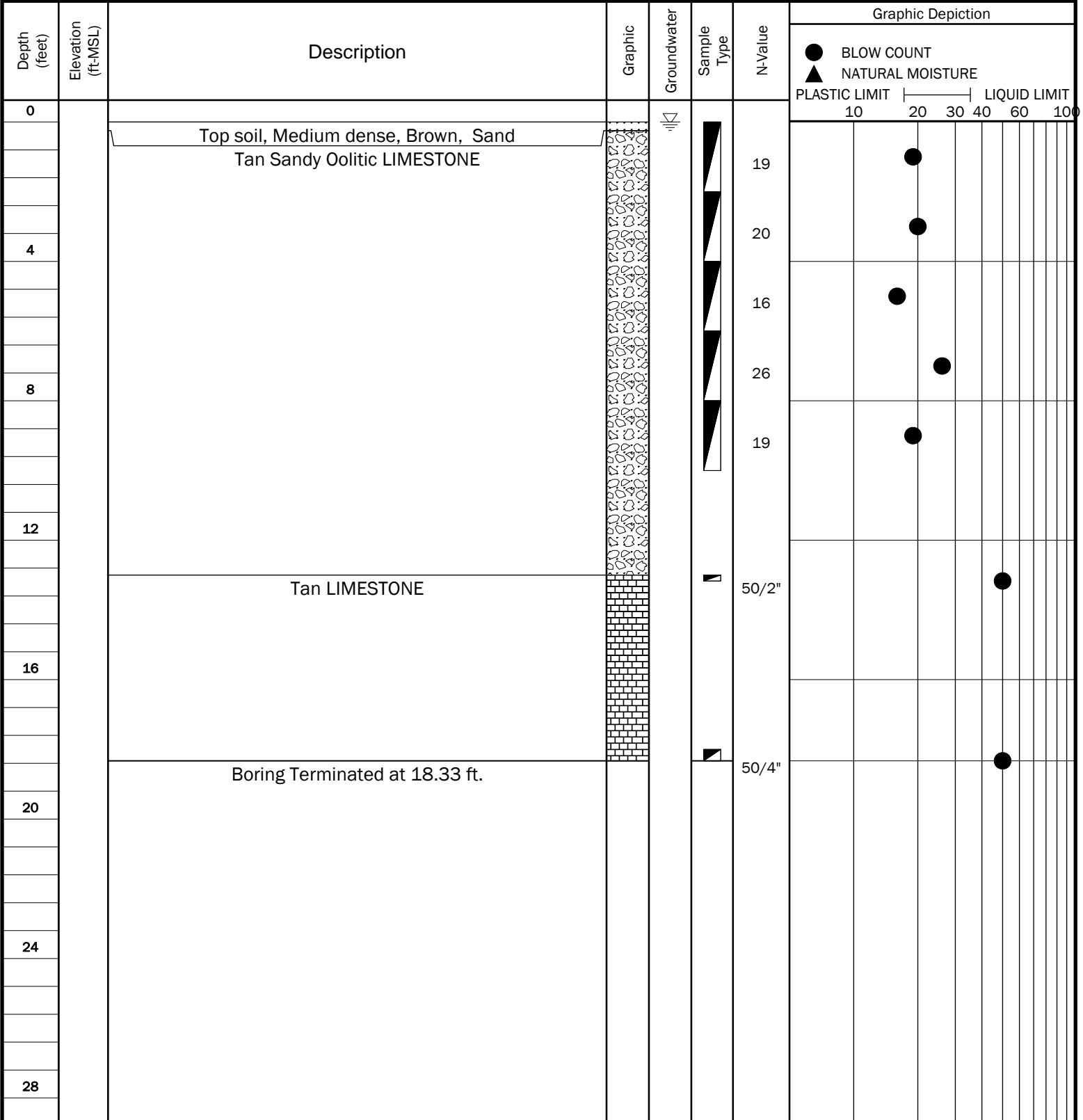






# TEST BORING RECORD B90

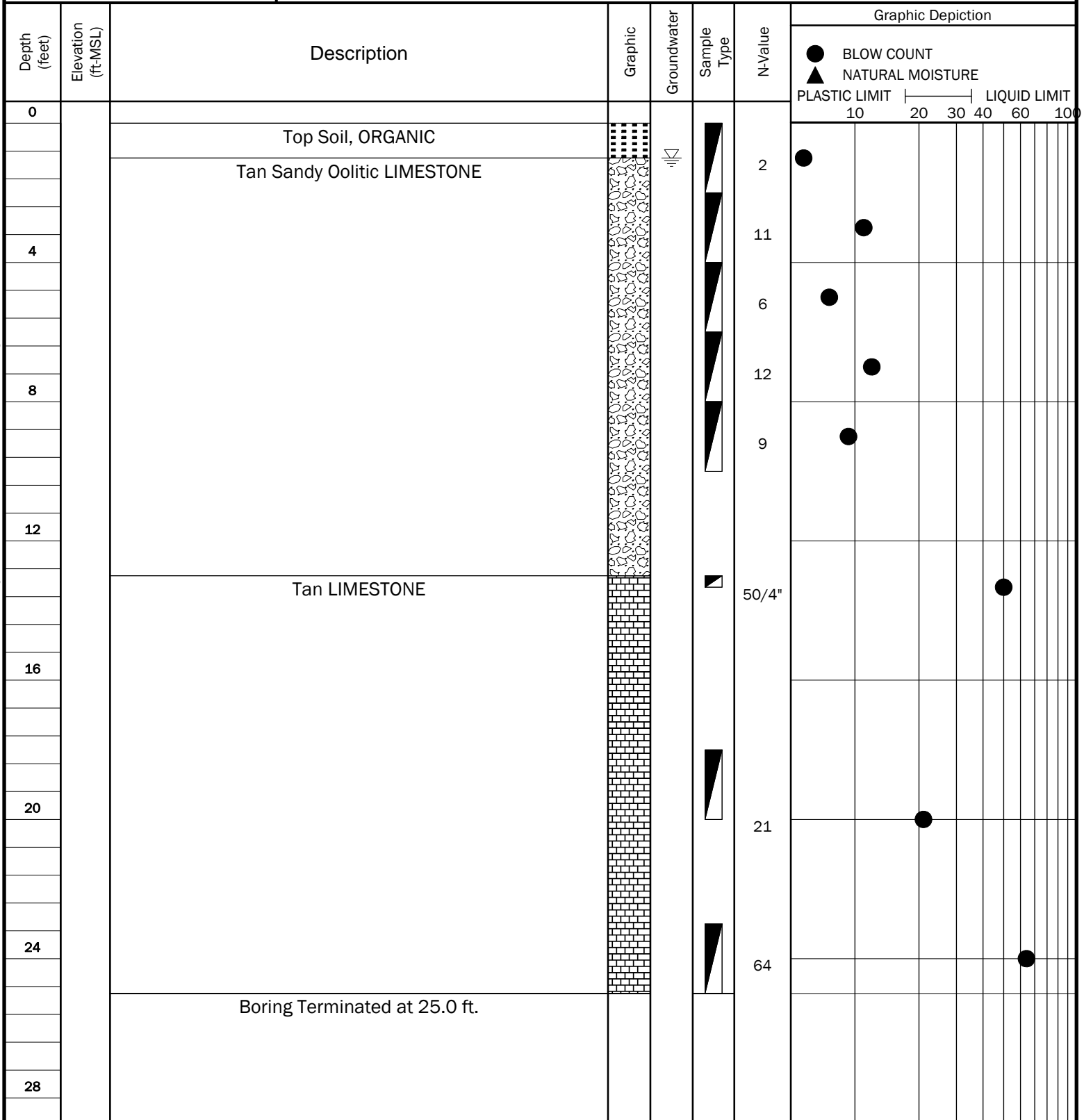
PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 11/01/17  
DEPTH TO - WATER> INITIAL: 0'0" AFTER 24 HOURS: N/A CAVING> C





# TEST BORING RECORD B91

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/25/17  
DEPTH TO - WATER> INITIAL: 1'0" AFTER 24 HOURS: N/A CAVING> C





# TEST BORING RECORD B92

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/25/17  
DEPTH TO - WATER> INITIAL: 1'0" AFTER 24 HOURS: N/A CAVING> C

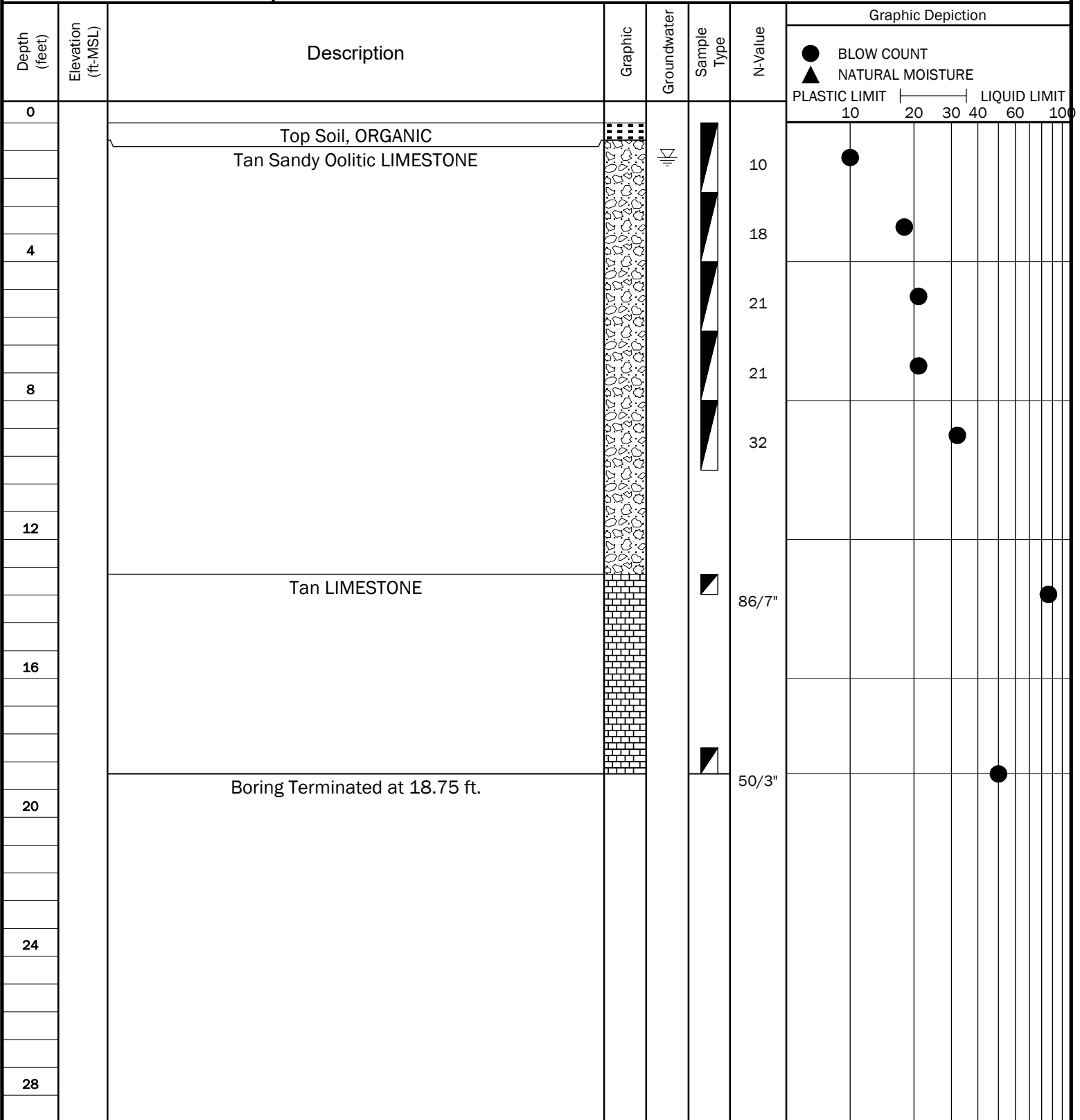
Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div><div>● BLOW COUNT</div><div>▲ NATURAL MOISTURE</div><div>PLASTIC LIMIT   LIQUID LIMIT</div><div>10 20 30 40 60 100</div></div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				7										
						11										
4						9										
						14										
8						11										
12																
		Tan LIMESTONE				50/5"										
16																
20		Boring Terminated at 18.33 ft.				50/4"										
24																
28																



# TEST BORING RECORD B93

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/24/17  
DEPTH TO - WATER> INITIAL: 1'4" AFTER 24 HOURS: N/A CAVING> C

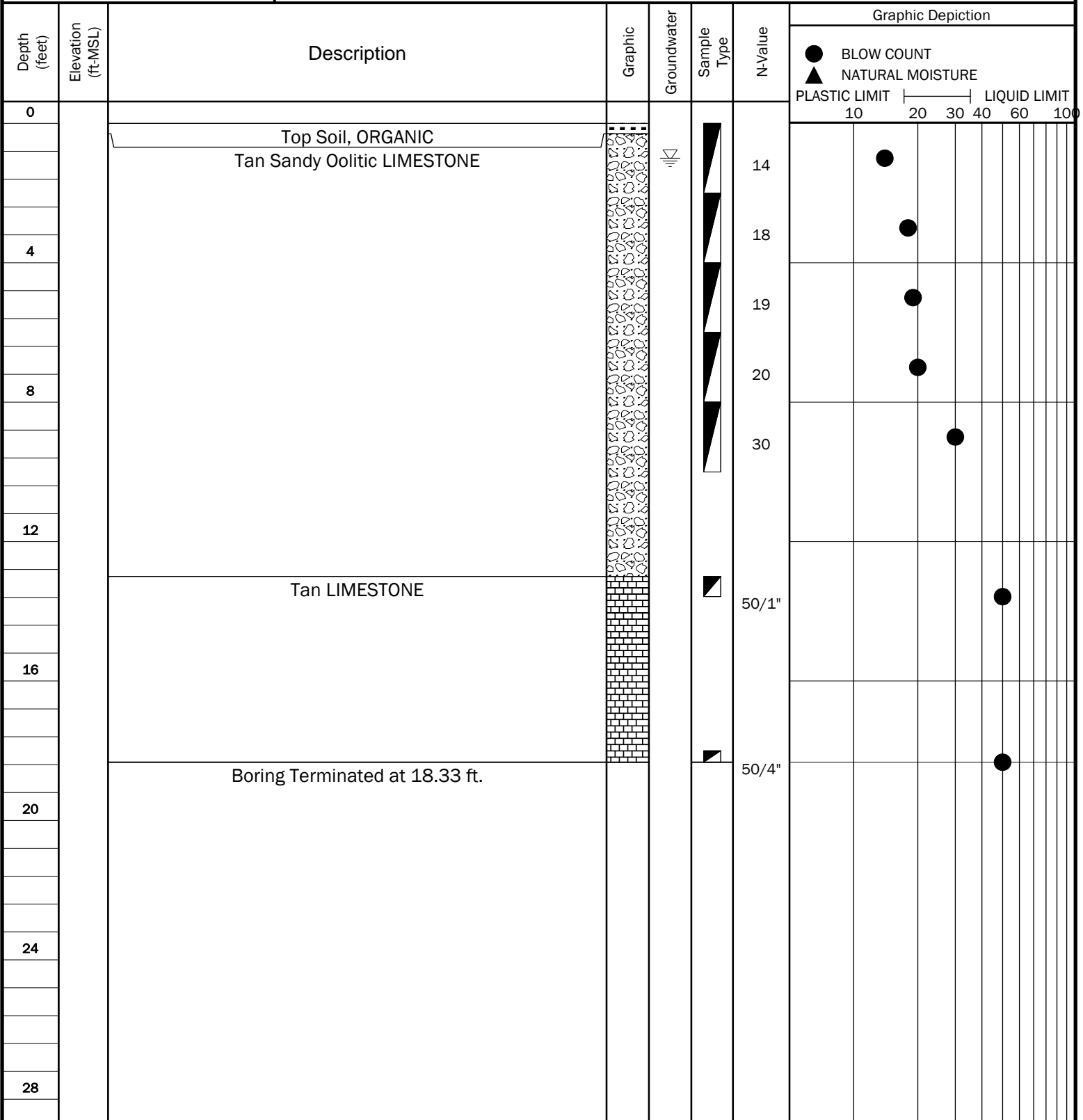
This information pertains only to this boring and should not be interpreted as being indicative of the site.





# TEST BORING RECORD B94

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/24/17  
DEPTH TO - WATER> INITIAL: 1'4" AFTER 24 HOURS: N/A CAVING> C





# TEST BORING RECORD B95

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/31/17  
DEPTH TO - WATER> INITIAL: 8" AFTER 24 HOURS: N/A CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				18										
						19										
4						15										
						16										
8						18										
12																
		Tan LIMESTONE				50/3"										
16																
20		Boring Terminated at 18.58 ft.				50/1"										
24																
28																



# TEST BORING RECORD B96

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/30/17  
DEPTH TO - WATER> INITIAL: 0'0" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				19										
						19										
4						15										
						16										
8						16										
12																
		Tan LIMESTONE				50/5"										
16																
20		Boring Terminated at 18.67 ft.				50/2"										
24																
28																



# TEST BORING RECORD B97

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/31/17  
DEPTH TO - WATER> INITIAL: 0'0" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC				13										
						24										
4						15										
						16										
8						21										
12																
		Tan LIMESTONE				50/3"										
16																
						50/1"										
20		Boring Terminated at 18.58 ft.														
24																
28																





# TEST BORING RECORD B98

PROJECT: Home Depot Geo Project

PROJECT NO.: 10101-2017021

CLIENT: Home Depot

PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL

LOCATION: See Boring Location Map

ELEVATION: N/A

DRILLER: J & R Precision Drilling, Inc

LOGGED BY: YV

DRILLING METHOD: Rotary Wash

DATE: 10/25/17

DEPTH TO - WATER> INITIAL: 1'1"

AFTER 24 HOURS: N/A

CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div><div>● BLOW COUNT</div><div>▲ NATURAL MOISTURE</div><div>PLASTIC LIMIT   LIQUID LIMIT</div><div>10 20 30 40 60 100</div></div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				7										
						9										
4						15										
						22										
8						20										
12																
		Tan LIMESTONE				50/4"										
16																
						50/4"										
20		Boring Terminated at 18.83 ft.														
24																
28																



# TEST BORING RECORD B99

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/25/17  
DEPTH TO - WATER> INITIAL: 1'2" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				10										
						15										
4						15										
						22										
8						21										
12																
		Tan LIMESTONE				50/3"										
16																
		Boring Terminated at 18.33 ft.				50/4"										
20																
24																
28																



# TEST BORING RECORD B100

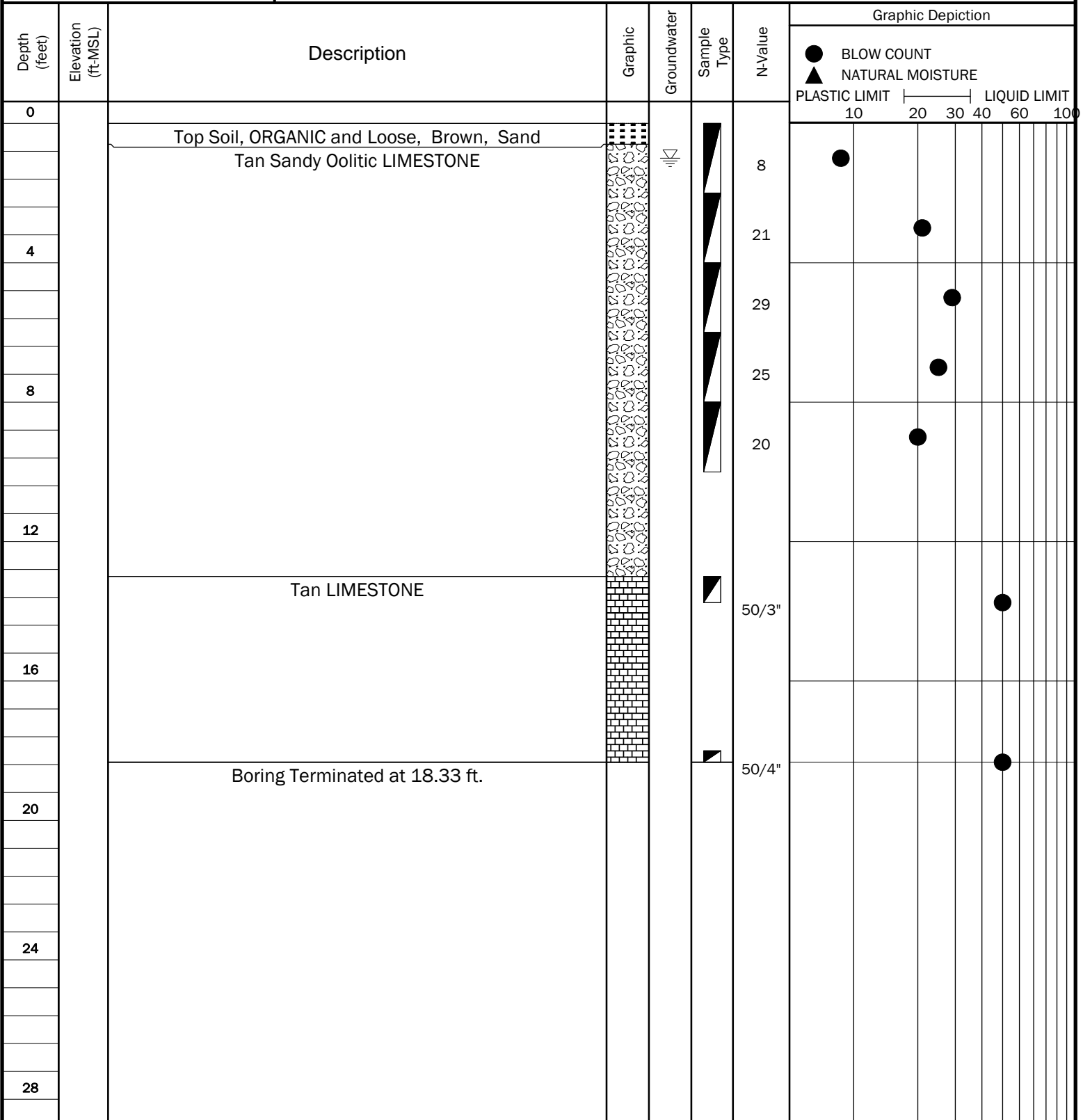
PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/25/17  
DEPTH TO - WATER> INITIAL: 1'3" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div><div>● BLOW COUNT</div><div>▲ NATURAL MOISTURE</div><div>PLASTIC LIMIT   LIQUID LIMIT</div><div>10 20 30 40 60 100</div></div>									
0		Top Soil, ORGANIC and Loose, Brown, Sand														
		Tan Sandy Oolitic LIMESTONE				6										
						21										
4						25										
						24										
8						27										
12																
		Tan LIMESTONE				50/1"										
16																
		Boring Terminated at 18.25 ft.				50/3"										
20																
24																
28																



# TEST BORING RECORD B101

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/25/17  
DEPTH TO - WATER> INITIAL: 1'3" AFTER 24 HOURS: N/A CAVING> C





# TEST BORING RECORD B102

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/31/17  
DEPTH TO - WATER> INITIAL: 1" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil ORGANIC														
		Tan Sandy Oolitic LIMESTONE				14										
						33										
4						23										
						23										
8						21										
12																
		Tan LIMESTONE				50/3"										
16																
						50/3"										
20		Boring Terminated at 18.25 ft.														
24																
28																



# TEST BORING RECORD B103

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/31/17  
DEPTH TO - WATER> INITIAL: 1" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				16										
						35										
4						25										
						25										
8						21										
12																
		Tan LIMESTONE				50/3"										
16																
		Boring Terminated at 18.33 ft.				50/4"										
20																
24																
28																



# TEST BORING RECORD B104

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/31/17  
DEPTH TO - WATER> INITIAL: 0'0" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				18										
						21										
4						15										
						14										
8						23										
12																
		Tan LIMESTONE				50/4"										
16																
						50/3"										
20		Boring Terminated at 18.25 ft.														
24																
28																



# TEST BORING RECORD B105

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/25/17  
DEPTH TO - WATER> INITIAL: 1'4" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				7										
						13										
4						14										
						18										
8						24										
12		Tan LIMESTONE				50/3"										
16						50/2"										
		Boring Terminated at 18.17 ft.														
20																
24																
28																





# TEST BORING RECORD B106

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/25/17  
DEPTH TO - WATER> INITIAL: 1'4" AFTER 24 HOURS: N/A CAVING> C

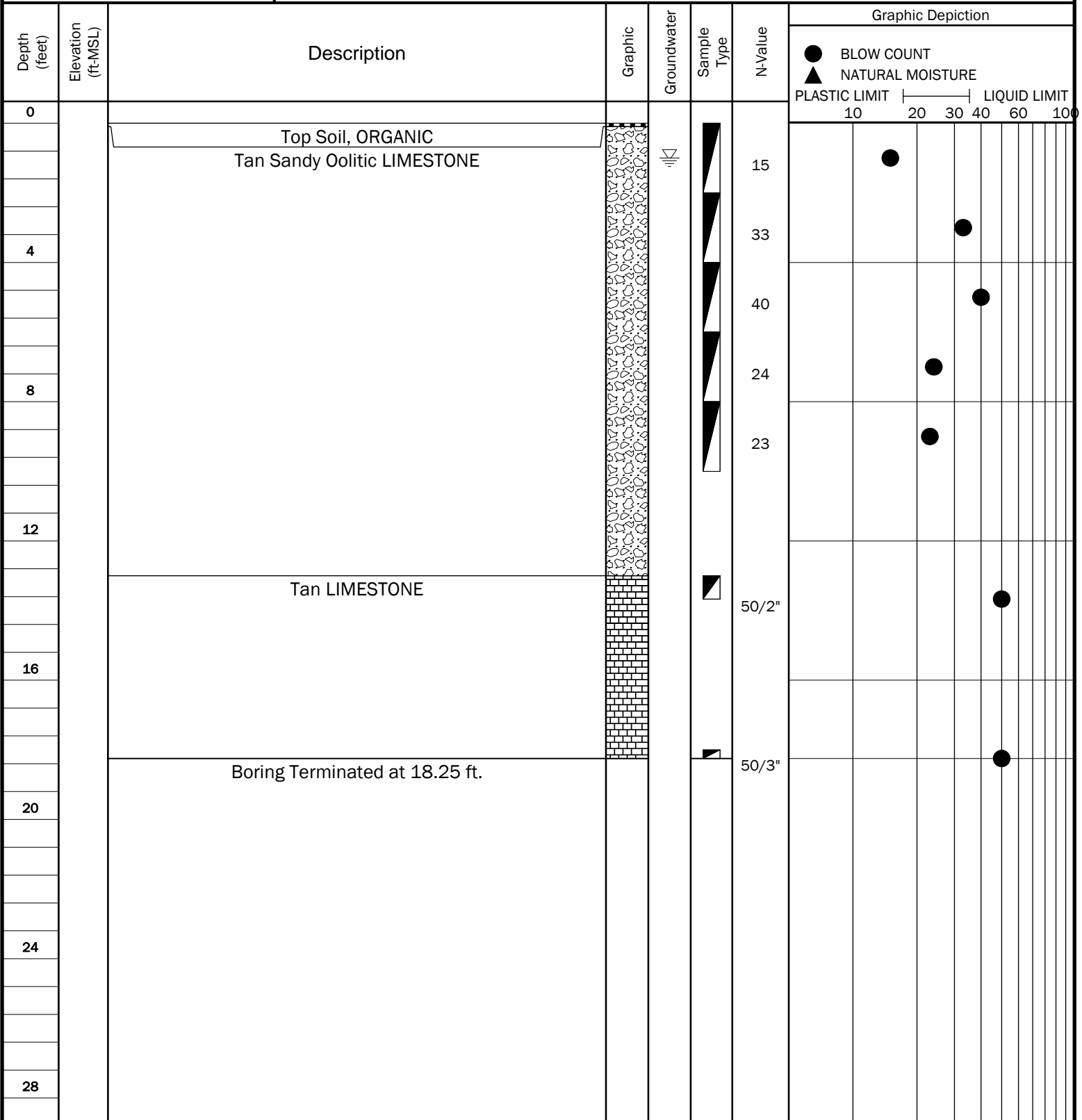
This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				4										
						14										
4						14										
						16										
8						17										
12																
		Tan LIMESTONE				50/2"										
16																
						50/4"										
20		Boring Terminated at 18.75 ft.														
24																
28																



# TEST BORING RECORD B107

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/25/17  
DEPTH TO - WATER> INITIAL: 1'2" AFTER 24 HOURS: N/A CAVING> C





# TEST BORING RECORD B108

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/30/17  
DEPTH TO - WATER> INITIAL: 0'0" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div><div>● BLOW COUNT</div><div>▲ NATURAL MOISTURE</div><div>PLASTIC LIMIT   LIQUID LIMIT</div><div>10 20 30 40 60 100</div></div>									
0		Top Soil, Medium Dense, Brown, Sand														
		Tan Sandy Oolitic LIMESTONE				19										
						21										
4						21										
						24										
8						21										
12																
		Tan LIMESTONE				50/4"										
16																
20		Boring Terminated at 18.67 ft.				50/2"										
24																
28																



# TEST BORING RECORD B109

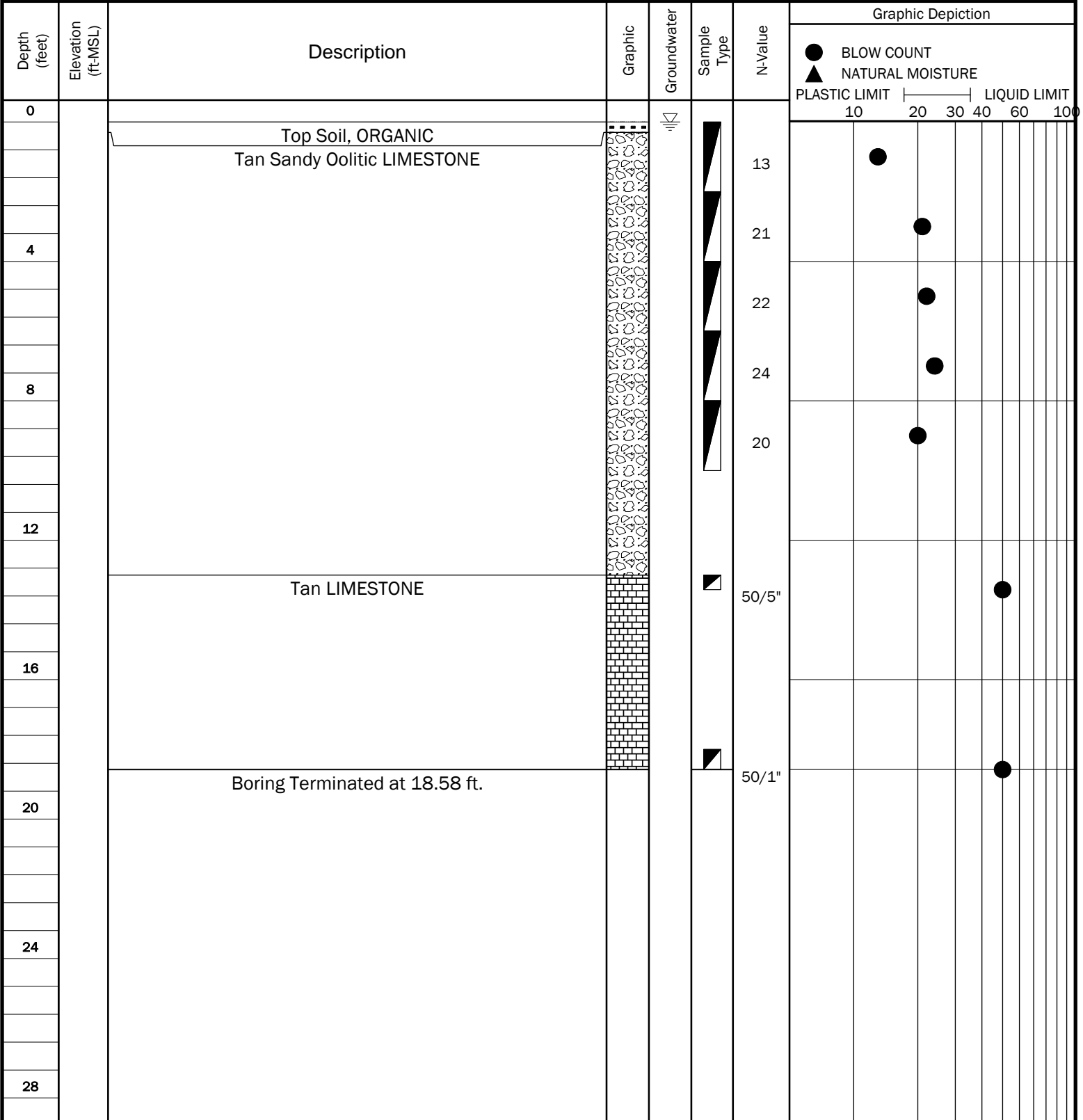
PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/31/17  
DEPTH TO - WATER> INITIAL: 1" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC MIXED with Medium dense, Brown, Sand														
		Tan Sandy Oolitic LIMESTONE				16										
						16										
4						21										
						25										
8						14										
12																
		Tan LIMESTONE				50/4"										
16																
20		Boring Terminated at 18.67 ft.				50/2"										
24																
28																



# TEST BORING RECORD B110

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/31/17  
DEPTH TO - WATER> INITIAL: 0'0" AFTER 24 HOURS: N/A CAVING> C





# TEST BORING RECORD B111

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/31/17  
DEPTH TO - WATER> INITIAL: 1'0" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, Medium dense, Brown, Sand														
		Tan Sandy Oolitic LIMESTONE				18										
						16										
4						12										
						14										
8						17										
12																
		Tan LIMESTONE				50/4"										
16																
						50/3"										
20		Boring Terminated at 18.25 ft.														
24																
28																



# TEST BORING RECORD B112

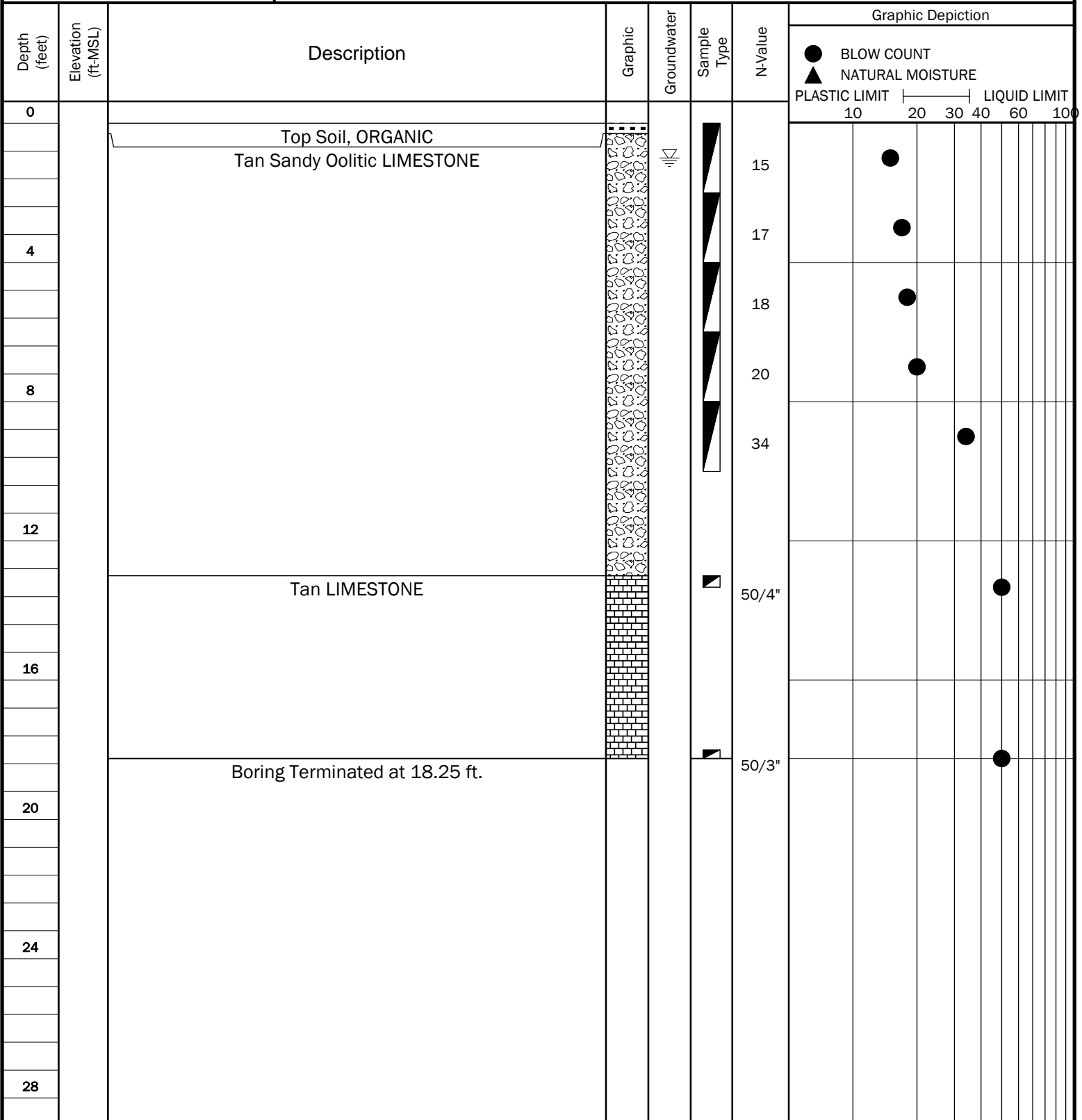
PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/26/17  
DEPTH TO - WATER> INITIAL: 2'0" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC mixed with Medium Dense, Brown, Sand														
		Tan Sandy Oolitic LIMESTONE				15										
						17										
4						18										
						19										
8						34										
12																
		Tan LIMESTONE				50/3"										
16																
		Boring Terminated at 18.33 ft.				50/4"										
20																
24																
28																



# TEST BORING RECORD B113

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/26/17  
DEPTH TO - WATER> INITIAL: 1'10" AFTER 24 HOURS: N/A CAVING> C

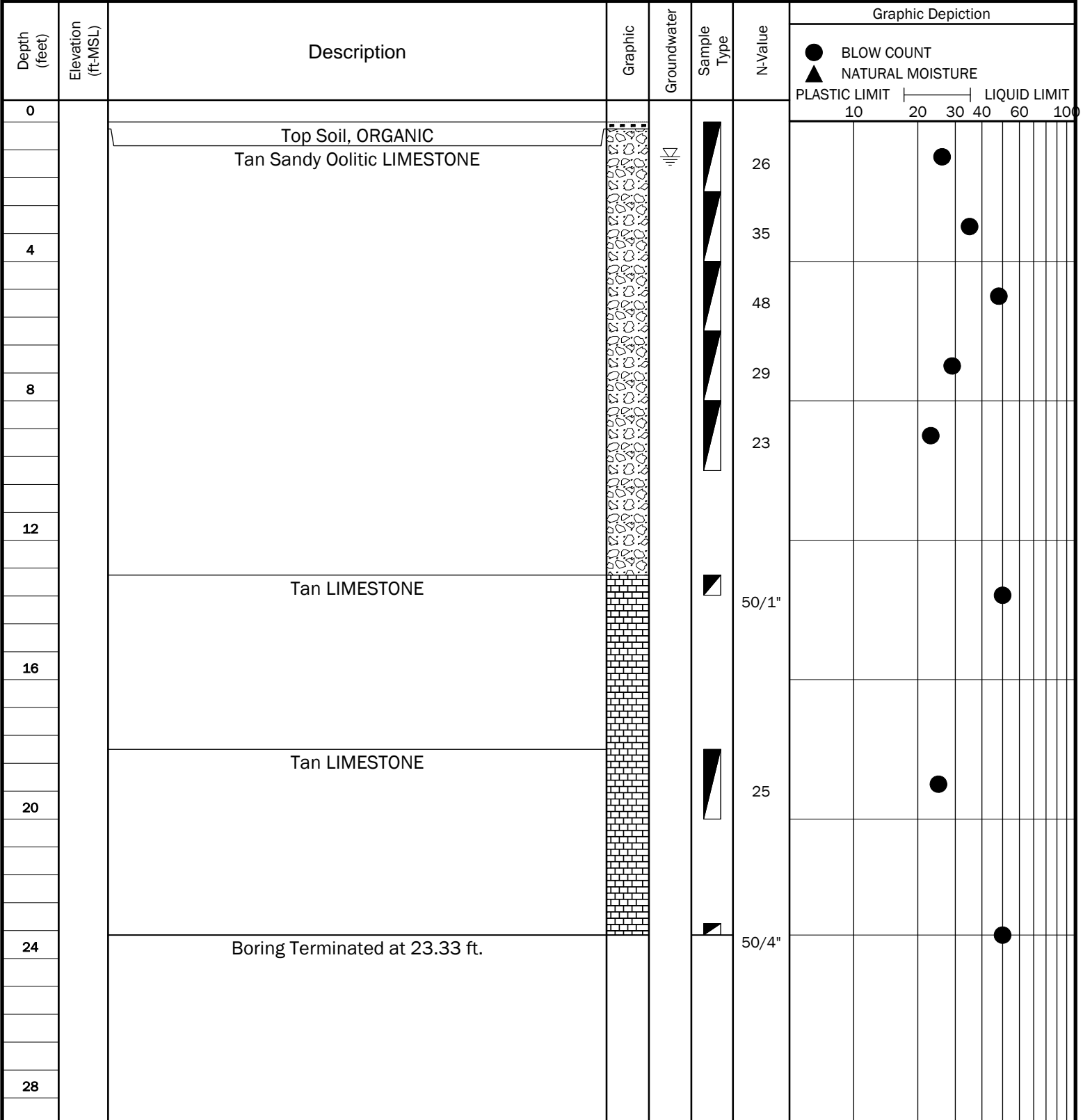






# TEST BORING RECORD B114

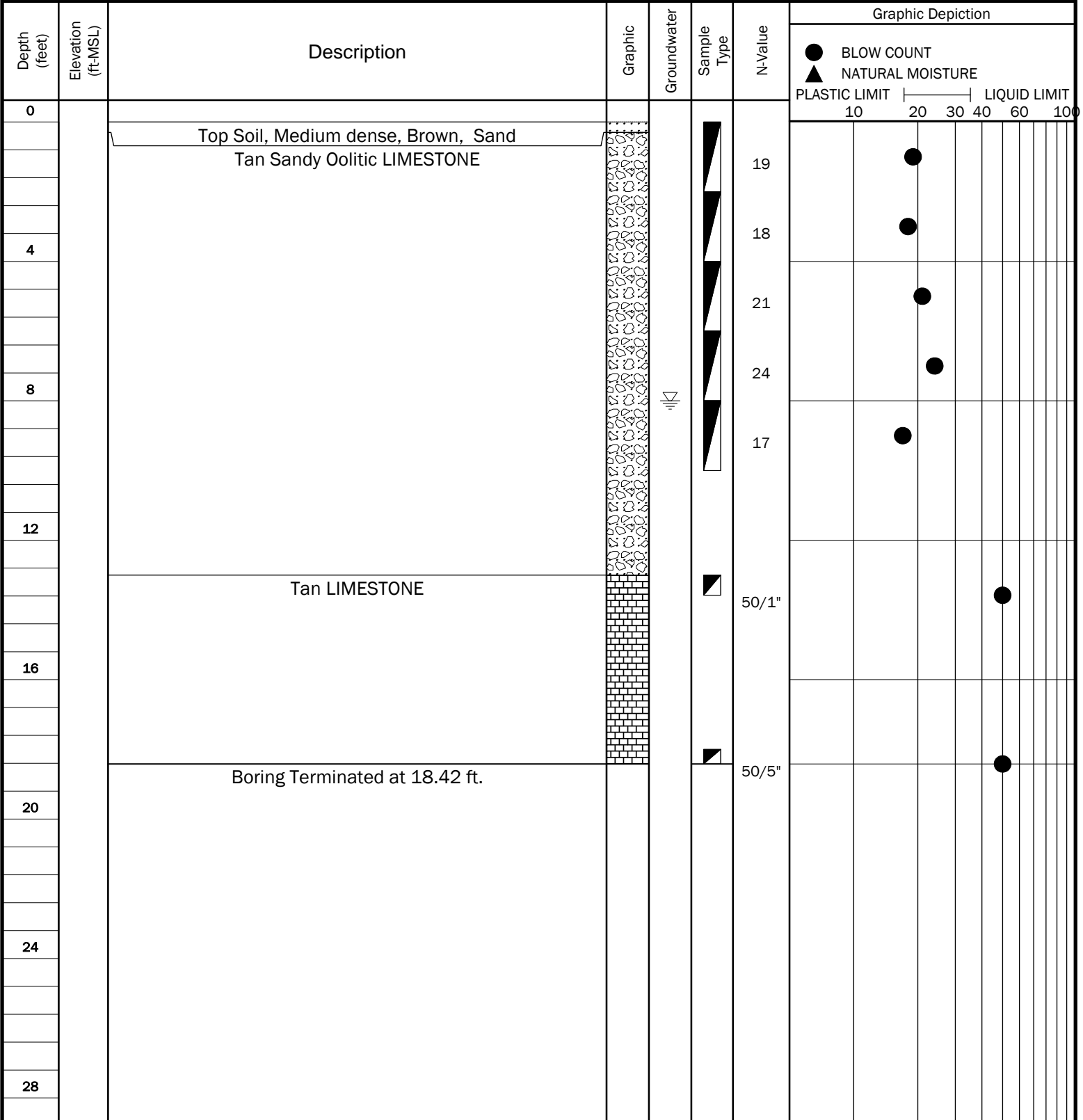
PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/25/17  
DEPTH TO - WATER> INITIAL: 1'2" AFTER 24 HOURS: N/A CAVING> C





# TEST BORING RECORD B115

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/30/17  
DEPTH TO - WATER> INITIAL: 8" AFTER 24 HOURS: N/A CAVING> C





# TEST BORING RECORD B116

PROJECT: Home Depot Geo Project

PROJECT NO.: 10101-2017021

CLIENT: Home Depot

PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL

LOCATION: See Boring Location Map

ELEVATION: N/A

DRILLER: J & R Precision Drilling, Inc

LOGGED BY: YV

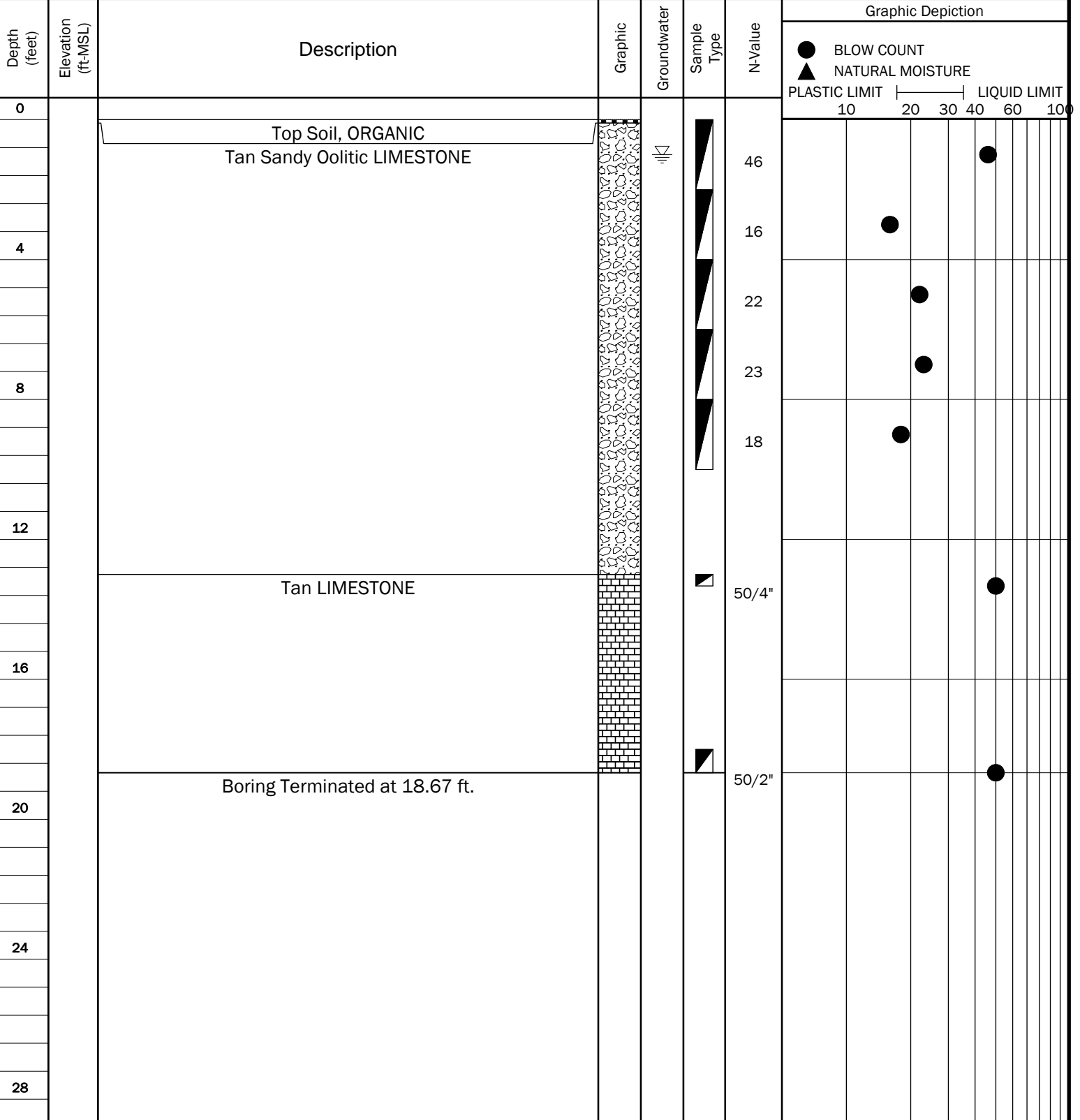
DRILLING METHOD: Rotary Wash

DATE: 10/26/17

DEPTH TO - WATER> INITIAL: 1'10"

AFTER 24 HOURS: N/A

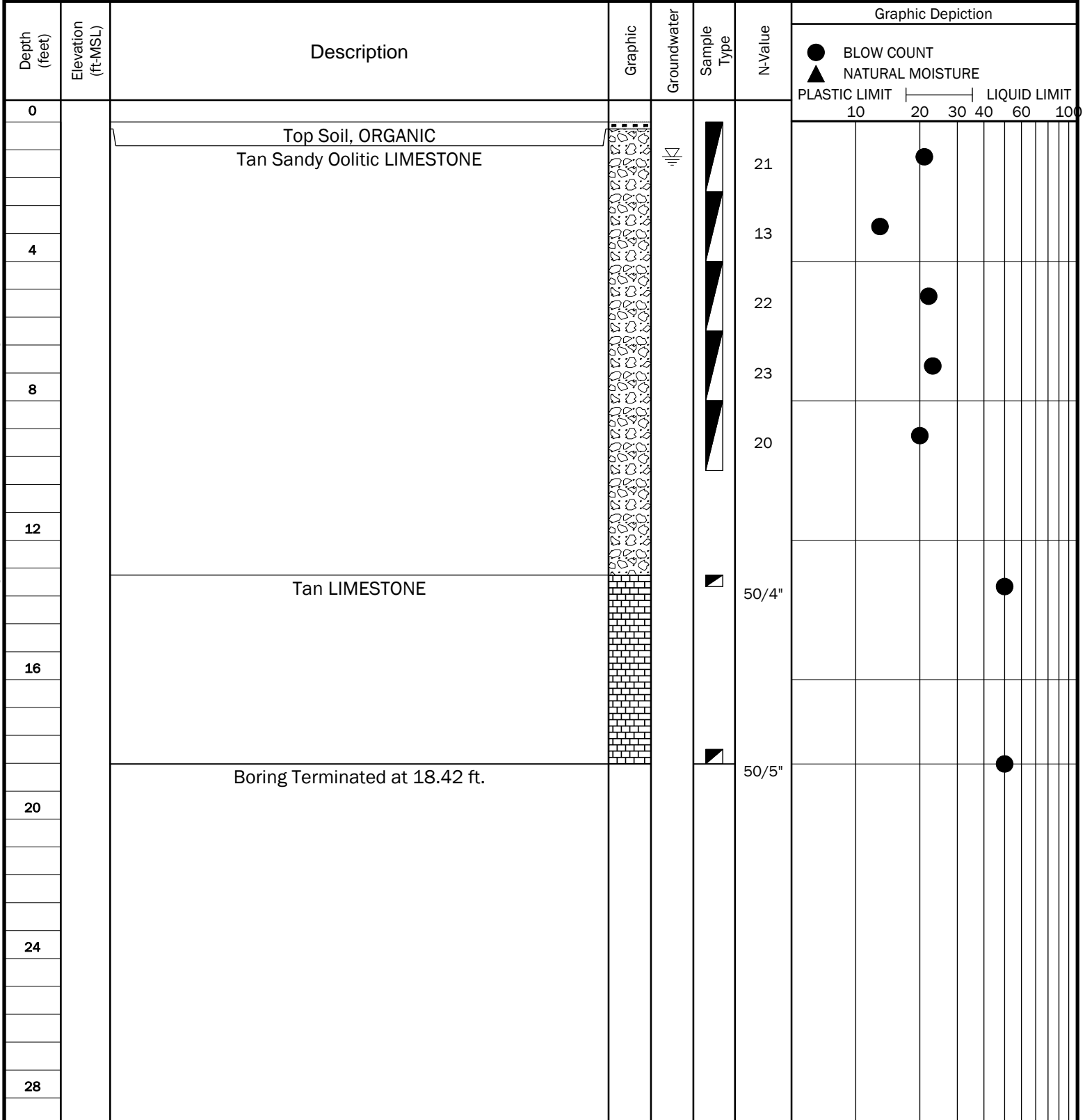
CAVING> C





# TEST BORING RECORD B117

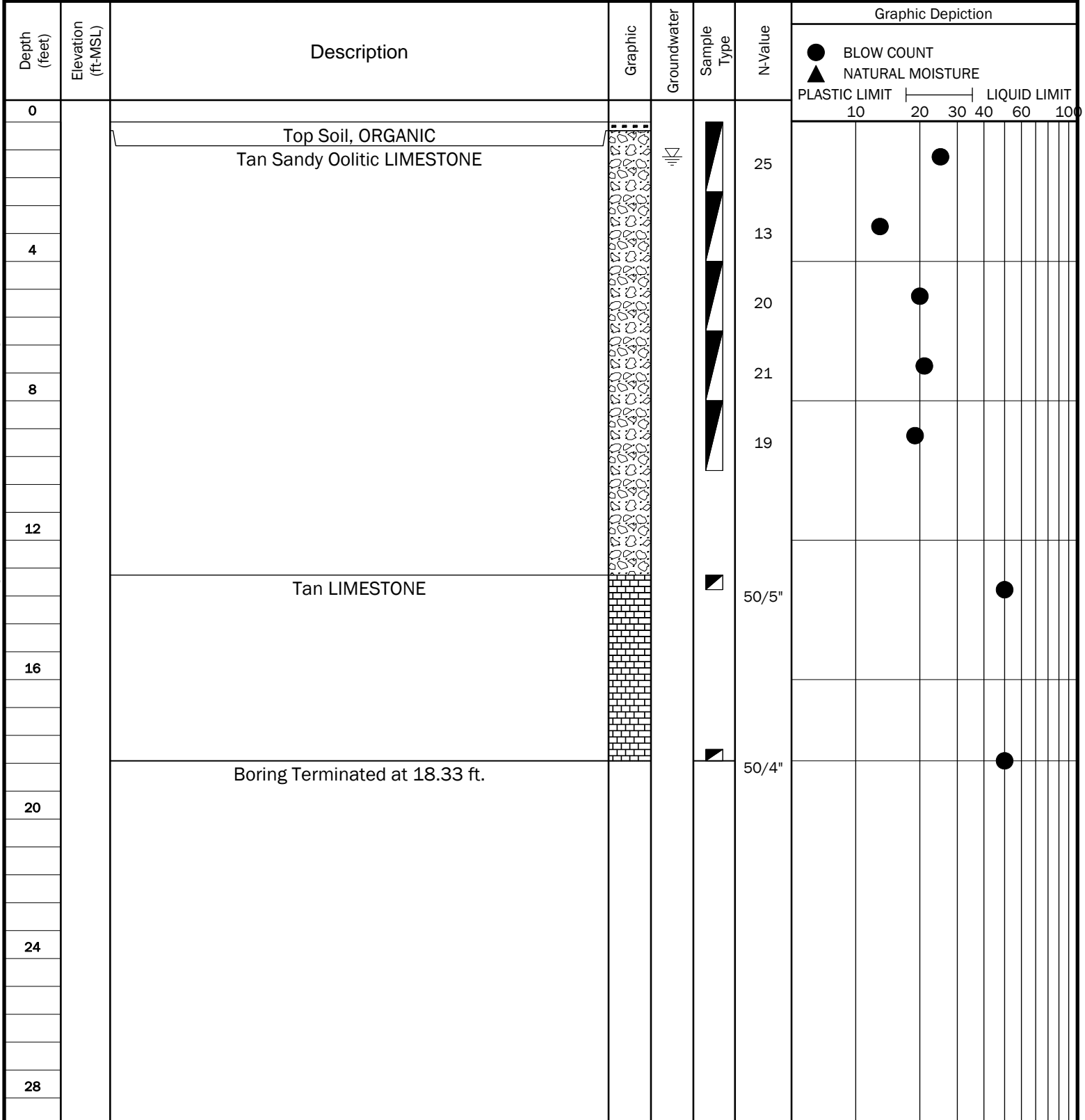
PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/26/17  
DEPTH TO - WATER> INITIAL: 1'10" AFTER 24 HOURS: N/A CAVING> C





# TEST BORING RECORD B118

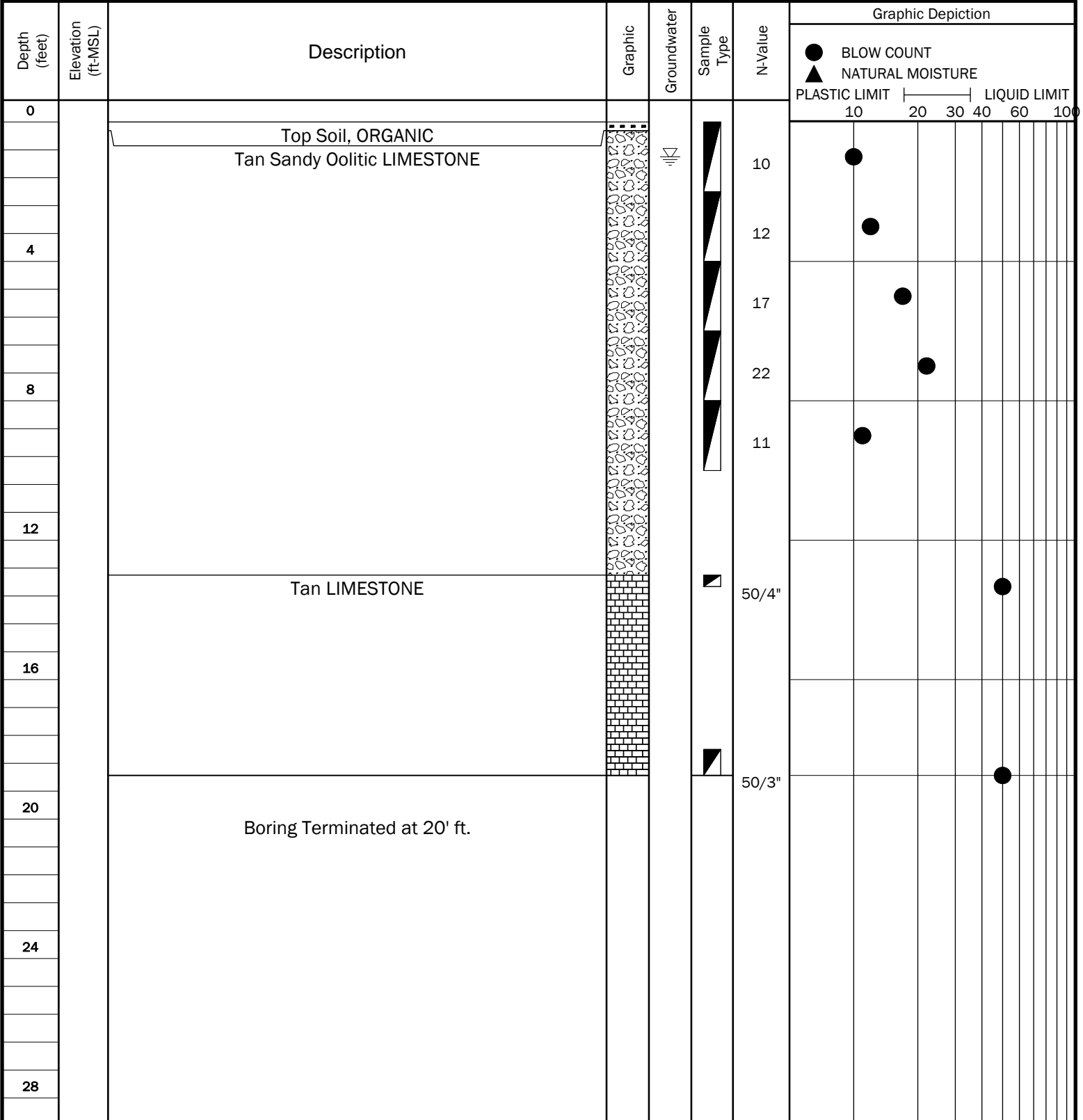
PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/26/17  
DEPTH TO - WATER> INITIAL: 1'11" AFTER 24 HOURS: N/A CAVING> C





# TEST BORING RECORD B119

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/26/17  
DEPTH TO - WATER> INITIAL: 1'8" AFTER 24 HOURS: N/A CAVING> C





# TEST BORING RECORD B120

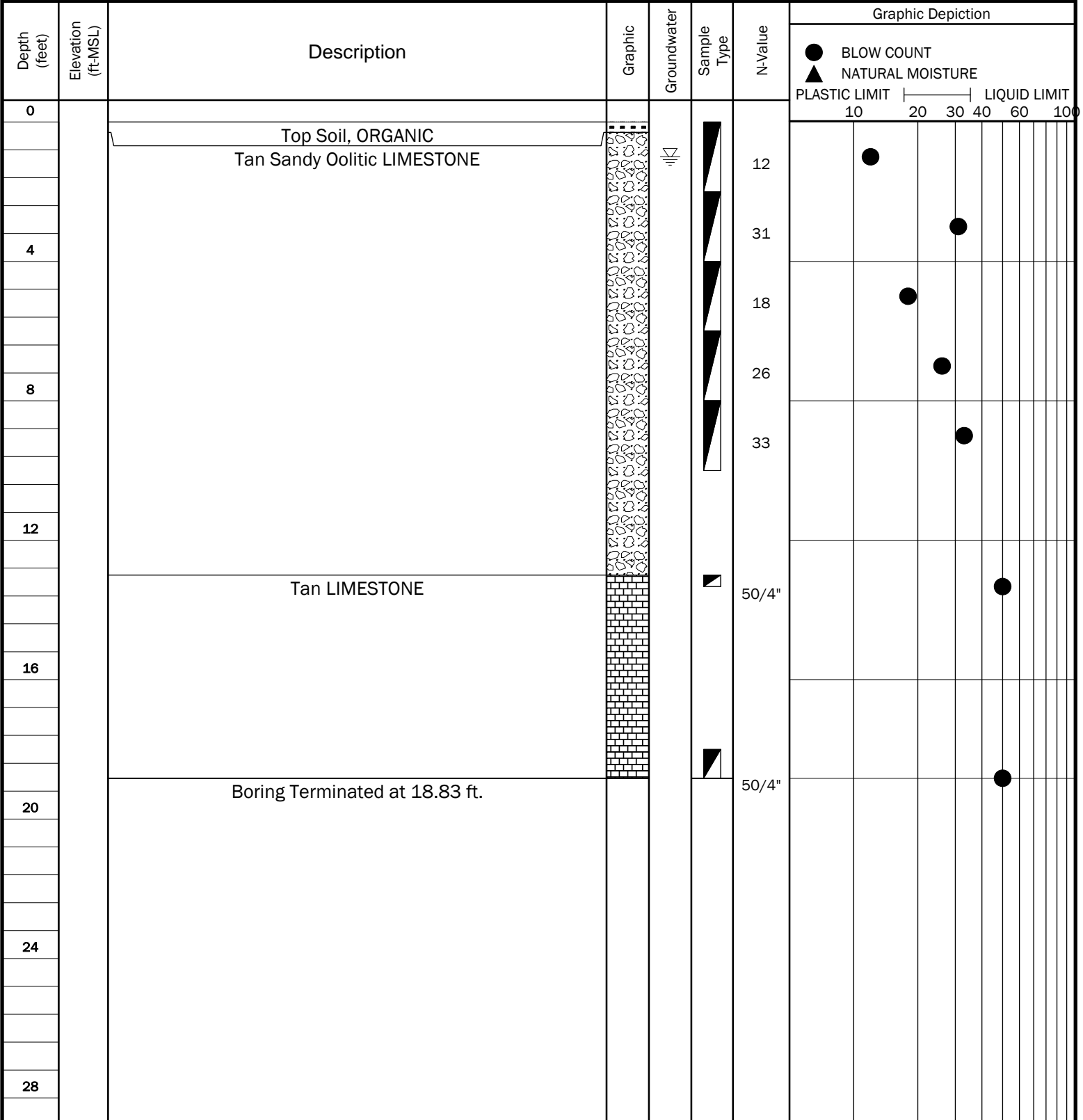
PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/26/17  
DEPTH TO - WATER> INITIAL: 1'8" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				4										
						12										
4						14										
						19										
8						6										
12																
		Tan LIMESTONE				50/4"										
16																
						50/4"										
20		Boring Terminated at 18.83 ft.														
24																
28																



# TEST BORING RECORD B121

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/26/17  
DEPTH TO - WATER> INITIAL: 1'7" AFTER 24 HOURS: N/A CAVING> C

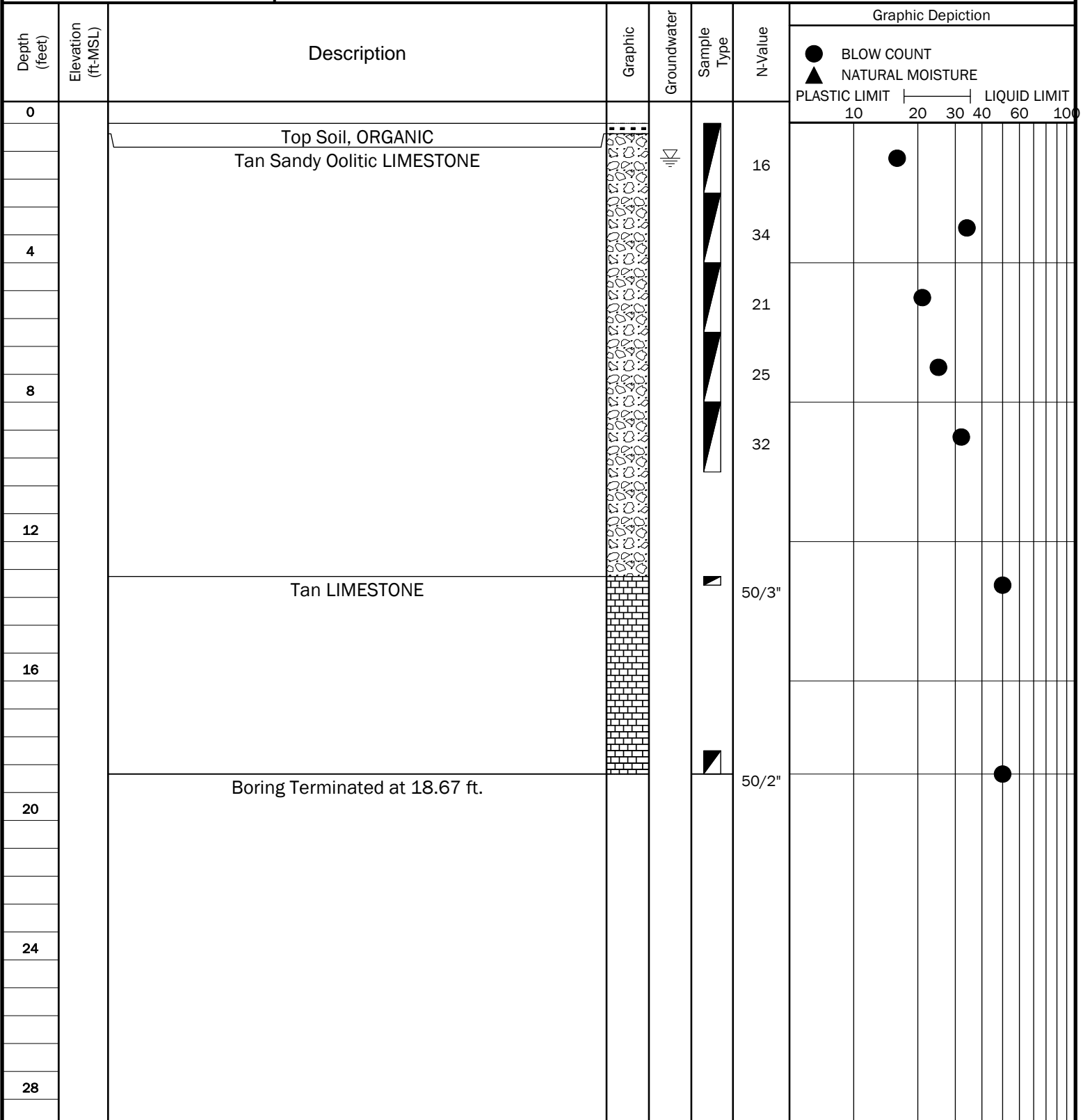






# TEST BORING RECORD B122

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/26/17  
DEPTH TO - WATER> INITIAL: 1'7" AFTER 24 HOURS: N/A CAVING> C





# TEST BORING RECORD B123

PROJECT: Home Depot Geo Project

PROJECT NO.: 10101-2017021

CLIENT: Home Depot

PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL

LOCATION: See Boring Location Map

ELEVATION: N/A

DRILLER: J & R Precision Drilling, Inc

LOGGED BY: YV

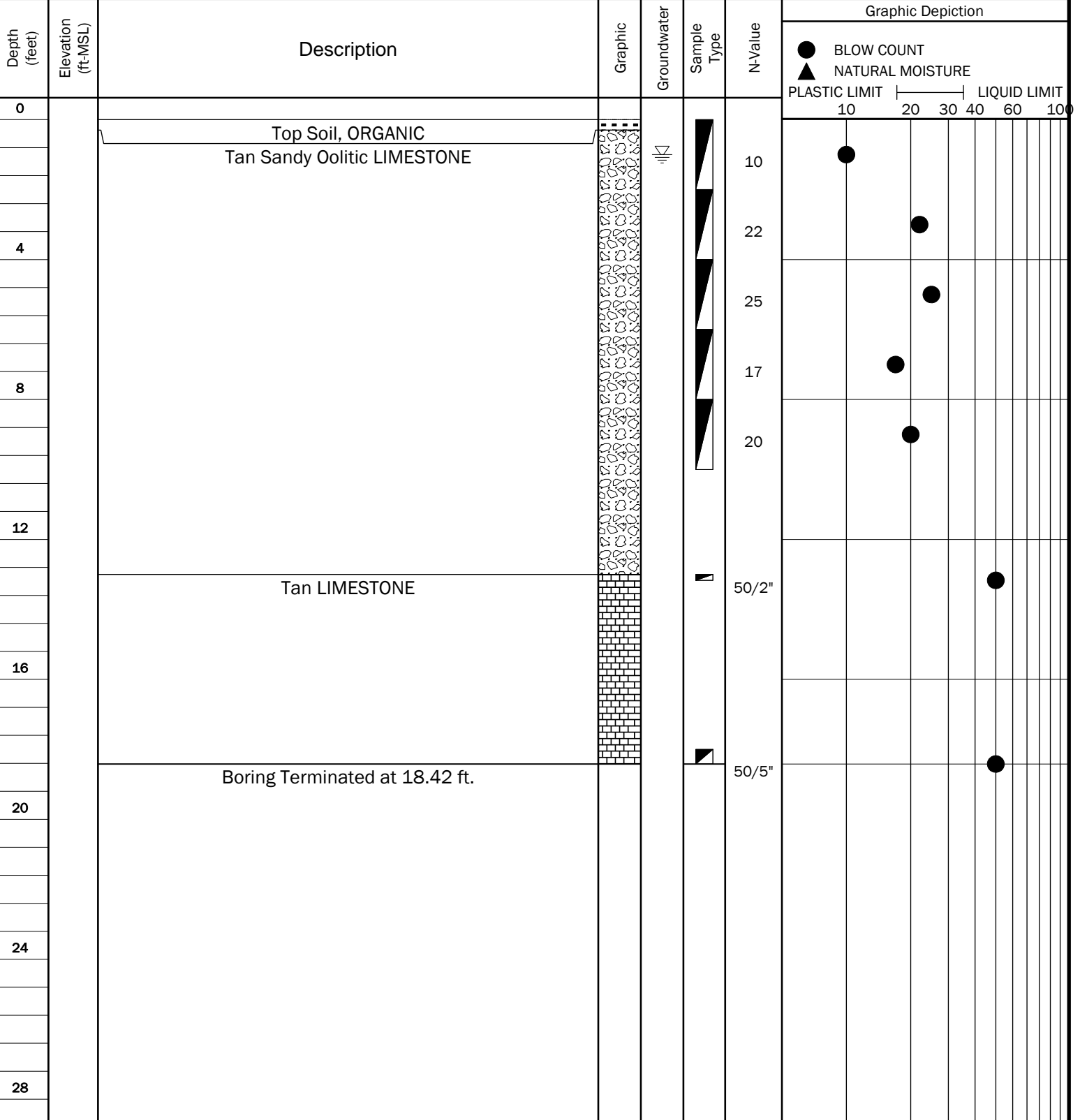
DRILLING METHOD: Rotary Wash

DATE: 10/26/17

DEPTH TO - WATER> INITIAL: 1'6"

AFTER 24 HOURS: N/A

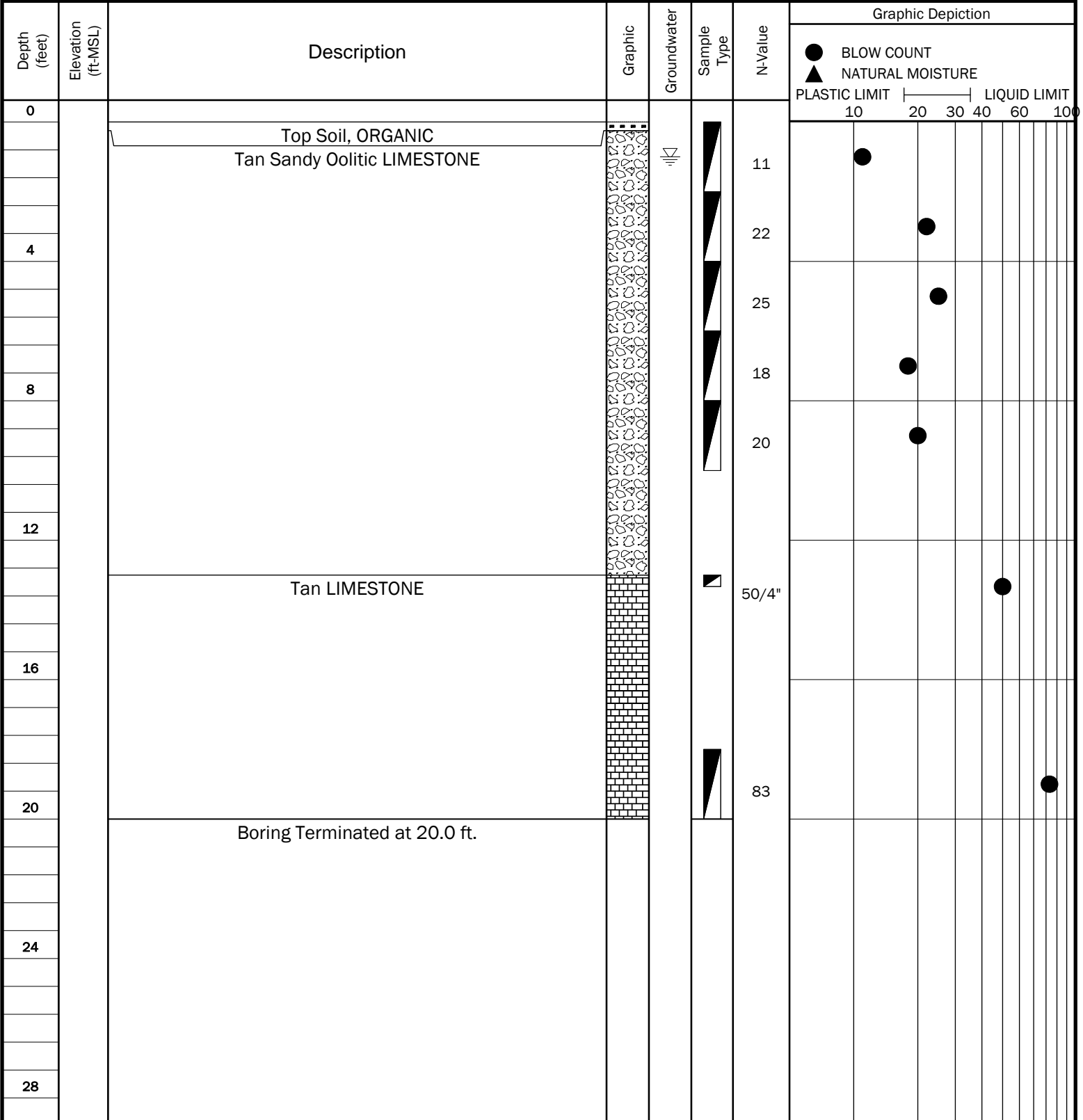
CAVING> C





# TEST BORING RECORD B124

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/26/17  
DEPTH TO - WATER> INITIAL: 1'8" AFTER 24 HOURS: N/A CAVING> C





# TEST BORING RECORD B125

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/20/17  
DEPTH TO - WATER> INITIAL: 2'0" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div><div>● BLOW COUNT</div><div>▲ NATURAL MOISTURE</div><div>PLASTIC LIMIT   LIQUID LIMIT</div><div>10 20 30 40 60 100</div></div>									
0		Top Soil, Loose, Brown, Sand				6	●									
		Tan Sandy Oolitic LIMESTONE				14	●									
4						12	●									
						21										
8						16	●									
12		Tan LIMESTONE				50/2"								●		
16																
		Boring Terminated at 18.10 ft.				50/1"								●		
20																
24																
28																



# TEST BORING RECORD B126

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/20/17  
DEPTH TO - WATER> INITIAL: 2'0" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div><div>● BLOW COUNT</div><div>▲ NATURAL MOISTURE</div><div>PLASTIC LIMIT   LIQUID LIMIT</div><div>10 20 30 40 60 100</div></div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				10										
						15										
4						13										
						10										
8						13										
12																
		Tan LIMESTONE				50/1"										
16																
20		Boring Terminated at 18.17 ft.				50/2"										
24																
28																



# TEST BORING RECORD B127

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/20/17  
DEPTH TO - WATER> INITIAL: 1'10" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div><div>● BLOW COUNT</div><div>▲ NATURAL MOISTURE</div><div>PLASTIC LIMIT   LIQUID LIMIT</div><div>10 20 30 40 60 100</div></div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				6										
						13										
4						13										
						16										
8						17										
12																
		Tan LIMESTONE				50/3"										
16																
20		Boring Terminated at 18.17 ft.				50/2"										
24																
28																



# TEST BORING RECORD B128

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/20/17  
DEPTH TO - WATER> INITIAL: 1'10" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, Medium dense, Brown, Sand				13										
		Tan Sandy Oolitic LIMESTONE				24										
4						17										
						21										
8						17										
12																
		Tan LIMESTONE				50/2"										
16																
						50/3"										
20		Boring Terminated at 18.25 ft.														
24																
28																



# TEST BORING RECORD B129

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/20/17  
DEPTH TO - WATER> INITIAL: 2'0" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				10										
4						17										
						15										
8						17										
						21										
12																
		Tan LIMESTONE				50/3"										
16																
		Boring Terminated at 18.10 ft.				50/1"										
20																
24																
28																





# TEST BORING RECORD B130

PROJECT: Home Depot Geo Project

PROJECT NO.: 10101-2017021

CLIENT: Home Depot

PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL

LOCATION: See Boring Location Map

ELEVATION: N/A

DRILLER: J & R Precision Drilling, Inc

LOGGED BY: YV

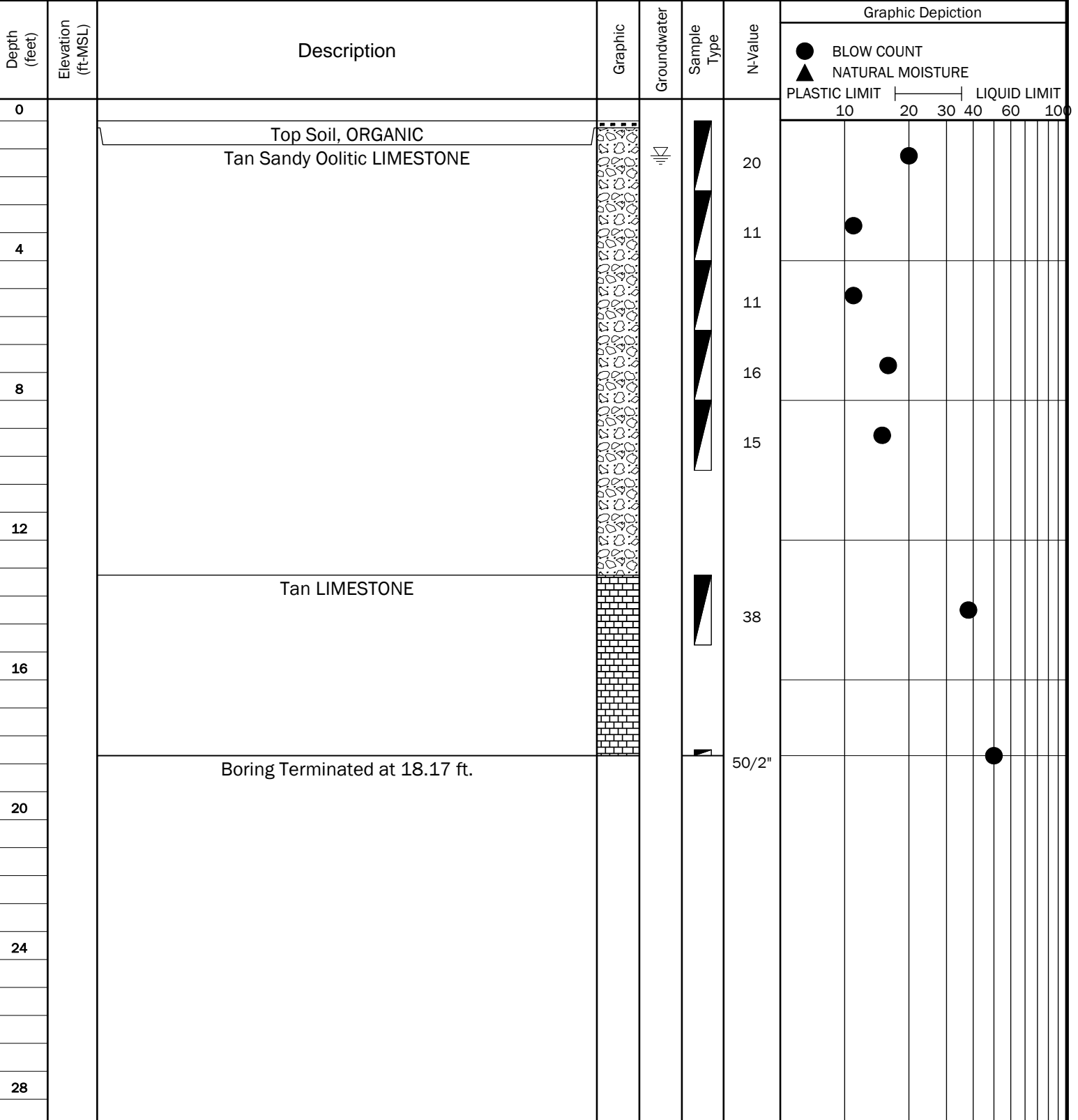
DRILLING METHOD: Rotary Wash

DATE: 10/20/17

DEPTH TO - WATER> INITIAL: 1'10"

AFTER 24 HOURS: N/A

CAVING> C





# TEST BORING RECORD B131

PROJECT: Home Depot Geo Project

PROJECT NO.: 10101-2017021

CLIENT: Home Depot

PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL

LOCATION: See Boring Location Map

ELEVATION: N/A

DRILLER: J & R Precision Drilling, Inc

LOGGED BY: YV

DRILLING METHOD: Rotary Wash

DATE: 10/20/17

DEPTH TO - WATER> INITIAL: 2'4"

AFTER 24 HOURS: N/A

CAVING> C

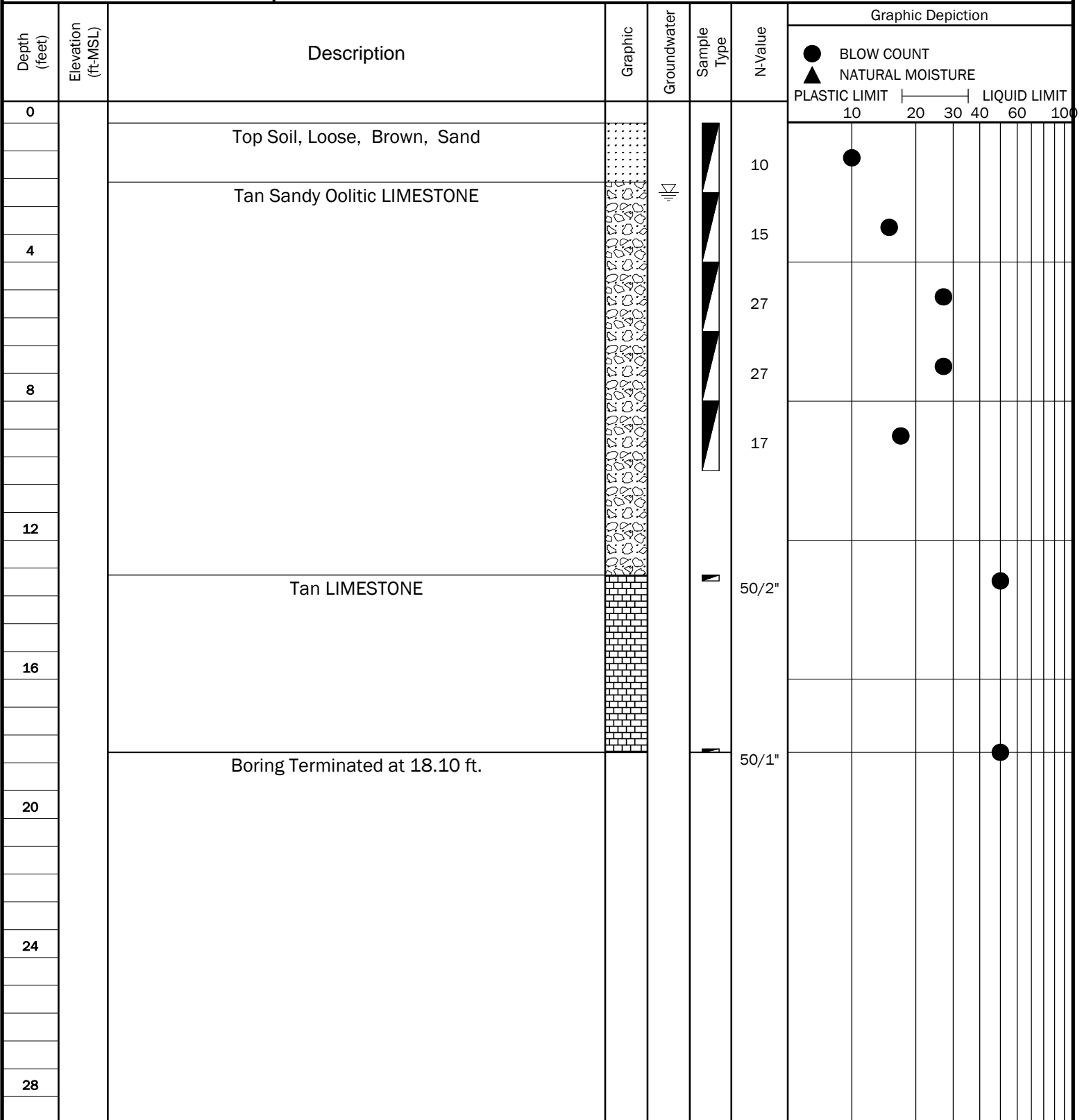
Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							● BLOW COUNT	▲ NATURAL MOISTURE	PLASTIC LIMIT		LIQUID LIMIT					
0		Top Soil, Very Loose to Loose, Brown, Sand				4	●									
4		Tan Sandy Oolitic LIMESTONE				7	●									
8						13		●								
						13		●								
12						13		●								
16		Tan LIMESTONE				50/4"						●				
20		Boring Terminated at 18.17 ft.				50/2"							●			
24																
28																



# TEST BORING RECORD B132

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/20/17  
DEPTH TO - WATER> INITIAL: 2'0" AFTER 24 HOURS: N/A CAVING> C

This information pertains only to this boring and should not be interpreted as being indicative of the site.





# TEST BORING RECORD B133

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/19/17  
DEPTH TO - WATER> INITIAL: 2'2" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, Loose, Brown, Sand														
		Tan Sandy Oolitic LIMESTONE				10										
						26										
4						22										
						19										
8						18										
12																
		Tan LIMESTONE				50/2"										
16																
		Boring Terminated at 18.10 ft.				20/1"										
20																
24																
28																



# TEST BORING RECORD B134

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/19/17  
DEPTH TO - WATER> INITIAL: 2'0" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				17										
						23										
4						15										
						19										
8						17										
12																
		Tan LIMESTONE				50/1"										
16																
		Boring Terminated at 18.17 ft.				50/2"										
20																
24																
28																



# TEST BORING RECORD B135

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/19/17  
DEPTH TO - WATER> INITIAL: 2'6" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC				3	●									
		Tan Sandy Oolitic LIMESTONE				12	●									
4						15	●									
						11	●									
8						14	●									
12																
		Tan LIMESTONE				50/1"						●				
16																
20		Boring Terminated at 18.17 ft.				50/2"						●				
24																
28																



# TEST BORING RECORD B136

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/19/17  
DEPTH TO - WATER> INITIAL: 2'4" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				10										
4						26										
						24										
8						23										
						25										
12																
		Tan LIMESTONE				50/1"										
16																
		Boring Terminated at 18.17 ft.				50/2"										
20																
24																
28																



# TEST BORING RECORD B137

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/19/17  
DEPTH TO - WATER> INITIAL: 2'0" AFTER 24 HOURS: N/A CAVING> C

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div>● BLOW COUNT</div> <div>▲ NATURAL MOISTURE</div> <div>PLASTIC LIMIT   LIQUID LIMIT</div> <div>10 20 30 40 60 100</div>									
0		Top Soil, ORGANIC														
		Tan Sandy Oolitic LIMESTONE				10										
						17										
4						17										
						18										
8						21										
12																
		Tan LIMESTONE				50/1"										
16																
						50/1"										
20		Boring Terminated at 18.10 ft.														
24																
28																





# TEST BORING RECORD B138

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/19/17  
DEPTH TO - WATER> INITIAL: 2'0" AFTER 24 HOURS: N/A CAVING> C

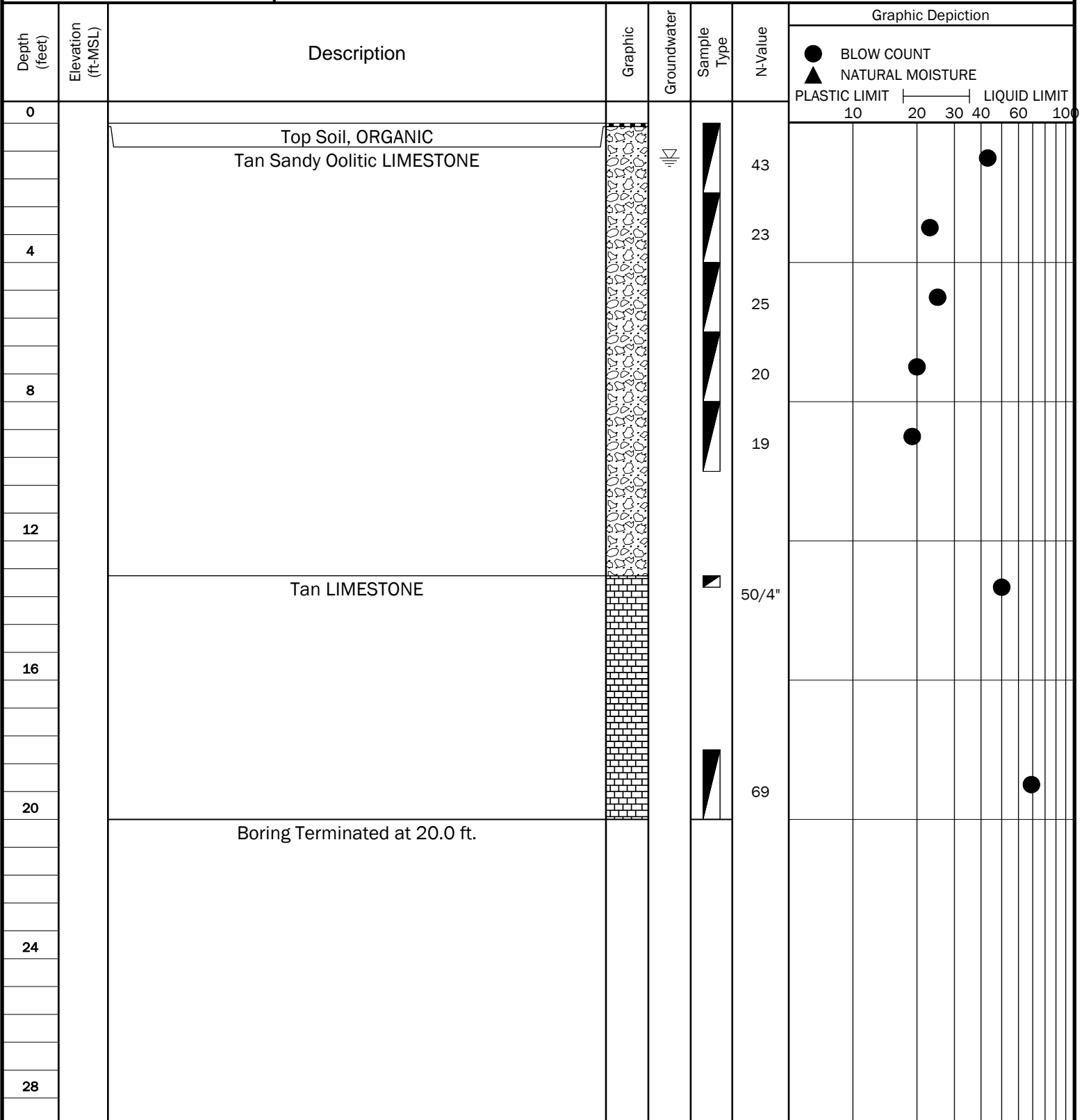
This information pertains only to this boring and should not be interpreted as being indicative of the site.

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value	Graphic Depiction									
							<div><div>● BLOW COUNT</div><div>▲ NATURAL MOISTURE</div><div>PLASTIC LIMIT   LIQUID LIMIT</div><div>10 20 30 40 60 100</div></div>									
0		Top Soil, Loose to Medium dense, Brown, Sand														
		Tan Sandy Oolitic LIMESTONE														
4																
8																
12																
		Tan LIMESTONE														
16																
20		Boring Terminated at 18.17 ft.														
24																
28																



# TEST BORING RECORD B139

PROJECT: Home Depot Geo Project PROJECT NO.: 10101-2017021  
CLIENT: Home Depot  
PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL  
LOCATION: See Boring Location Map ELEVATION: N/A  
DRILLER: J & R Precision Drilling, Inc LOGGED BY: YV  
DRILLING METHOD: Rotary Wash DATE: 10/20/17  
DEPTH TO - WATER> INITIAL: 1'10" AFTER 24 HOURS: N/A CAVING> C





# TEST BORING RECORD B140

PROJECT: Home Depot Geo Project

PROJECT NO.: 10101-2017021

CLIENT: Home Depot

PROJECT LOCATION: Fl. Turnpike & SR 836, Doral, FL

LOCATION: See Boring Location Map

ELEVATION: N/A

DRILLER: J & R Precision Drilling, Inc

LOGGED BY: YV

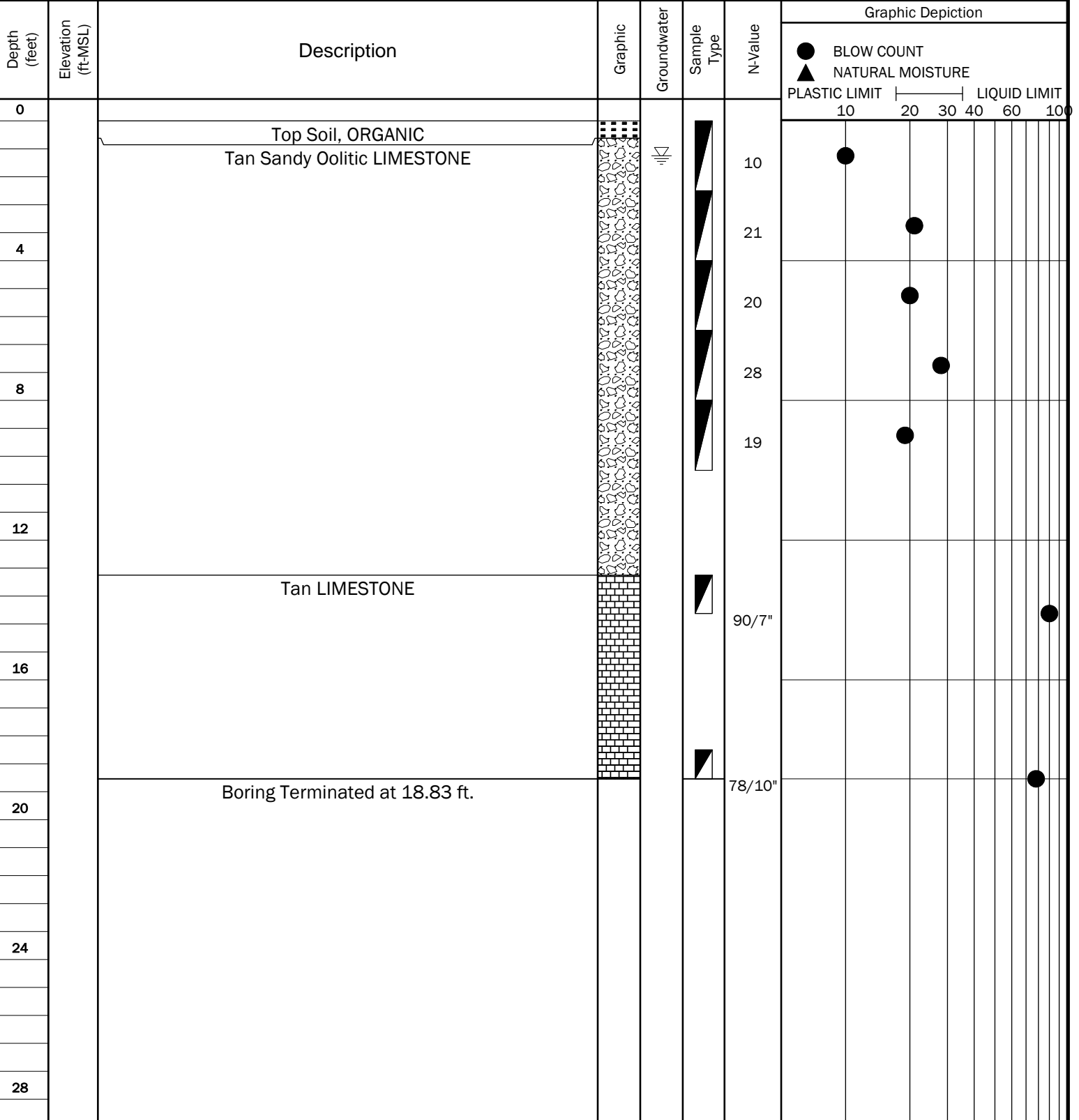
DRILLING METHOD: Rotary Wash

DATE: 10/20/17

DEPTH TO - WATER> INITIAL: 1'6"

AFTER 24 HOURS: N/A

CAVING> C



# KEY TO SYMBOLS

Symbol	Description
--------	-------------

## Strata symbols



Organics



Description not given for:  
"S9"



Blank



Sand



Limestone

## Misc. Symbols



Water table during  
drilling

## Soil Samplers



Standard penetration test

## Notes:

1. Exploratory borings were drilled on 10/20/17 using a 4-inch diameter continuous flight power auger.
2. No free water was encountered at the time of drilling or when re-checked the following day.
3. Boring locations were taped from existing features and elevations extrapolated from the final design schematic plan.
4. These logs are subject to the limitations, conclusions, and recommendations in this report.
5. Results of tests conducted on samples recovered are reported on the logs.

## **APPENDIX B**

### **Qualifications of Recommendations**

## QUALIFICATIONS OF RECOMMENDATIONS

The findings, conclusions and recommendations presented in this report represent our professional opinions concerning subsurface conditions at the site. The opinions presented are relative to the dates of our site work and should not be relied on to represent conditions at later dates or at locations not explored. The opinions included herein are based on information provided to us, the data obtained at specific locations during the study and our past experience. If additional information becomes available that might impact our geotechnical opinions, it will be necessary for NOVA to review the information, reassess the potential concerns, and re-evaluate our conclusions and recommendations.

Regardless of the thoroughness of a geotechnical exploration, there is the possibility that conditions between borings will differ from those encountered at specific boring locations, that conditions are not as anticipated by the designers and/or the contractors, or that either natural events or the construction process have altered the subsurface conditions. These variations are an inherent risk associated with subsurface conditions in this region and the approximate methods used to obtain the data. These variations may not be apparent until construction.

The professional opinions presented in this geotechnical report are not final. Field observations and foundation installation monitoring by the geotechnical engineer, as well as soil density testing and other quality assurance functions associated with site earthwork and foundation construction, are an extension of this report. Therefore, NOVA should be retained by the owner to observe all earthwork and foundation construction to document that the conditions anticipated in this study actually exist, and to finalize or amend our conclusions and recommendations. NOVA is not responsible or liable for the conclusions and recommendations presented in this report if NOVA does not perform these observation and testing services.

This report is intended for the sole use of FPL only. The scope of work performed during this study was developed for purposes specifically intended by and may not satisfy other users' requirements. Use of this report or the findings, conclusions or recommendations by others will be at the sole risk of the user. NOVA is not responsible or liable for the interpretation by others of the data in this report, nor their conclusions, recommendations or opinions.

Our professional services have been performed, our findings obtained, our conclusions derived and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices in the State of Florida. This warranty is in lieu of all other statements or warranties, either expressed or implied.

# Important Information about Your Geotechnical Engineering Report

*Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.*

*While you cannot eliminate all such risks, you can manage them. The following information is provided to help.*

## **Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects**

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you — should apply the report for any purpose or project except the one originally contemplated.*

## **Read the Full Report**

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

## **A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors**

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,

- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

## **Subsurface Conditions Can Change**

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

## **Most Geotechnical Findings Are Professional Opinions**

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

## **A Report's Recommendations Are *Not* Final**

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final*, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual



subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

### **A Geotechnical Engineering Report Is Subject to Misinterpretation**

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

### **Do Not Redraw the Engineer's Logs**

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

### **Give Contractors a Complete Report and Guidance**

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time to perform additional study.* Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

### **Read Responsibility Provisions Closely**

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that

have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

### **Geoenvironmental Concerns Are Not Covered**

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

### **Obtain Professional Assistance To Deal with Mold**

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

### **Rely on Your ASFE-Member Geotechnical Engineer for Additional Assistance**

Membership in ASFE/THE BEST PEOPLE ON EARTH exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with you ASFE-member geotechnical engineer for more information.



8811 Colesville Road/Suite G106, Silver Spring, MD 20910

Telephone: 301/565-2733 Facsimile: 301/589-2017

e-mail: [info@asfe.org](mailto:info@asfe.org) [www.asfe.org](http://www.asfe.org)

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November 27, 2017

**HOME DEPOT**

2455 Paces Ferry Road  
Atlanta, GA 30339

**Attention:** Mr. Alan Williams, Jr.

**Subject:** Addendum to Geotechnical Engineering Report –  
Sulfates Content Testing Results  
HOME DEPOT  
FL Turnpike & SR 836  
Doral, FL  
NOVA Project Number 10101-2016016

Dear Mr. Williams:

**NOVA Engineering and Environmental, LLC (NOVA)** has completed the addendum to our authorized Geotechnical Engineering Report for the Beacon Lakes, HOME DEPOT site, located in Doral, Florida. This report contains the results of the Sulfates Content Testing Results which was not included in our original report. This addendum to our report is based on NOVA proposal Number 001-30166352, dated March 31, 2017 (revised September 12, 2017), and the Professional Service Agreement signed by HOME DEPOT and Nova Engineering & Environmental, LLC on October 10, 2017.

Two soils samples from borings B-58 and B-116 obtained from 2 to 4 feet were used for sulfate tests. According to “Environmental Classification, Concrete and Steel Structures, and Construction Criteria” in Florida Department Transportation (FDOT) Structures Design Guidelines for Load Factor Design for Load Factor Design, effective January 1, 2000, the on-site soils will be considered to be “Slightly Aggressive” if Sulfates content is less than 150 ppm.

The sulfate contents were measured to be below detection limits in the two samples tested from near ground surface. The sulfate content in the sample obtained from near surface from B-58 was measured to be 42 ppm, below the threshold value of 150 ppm. The on-site near surface soils around boring B-58 are thus considered “Slightly Aggressive” in terms of sulfate. The sulfate content in the sample obtained from near surface from B-116 was measured to be 348 ppm, above the threshold value of 150 ppm; therefore, the near surface soils around B-116 is considered “Moderately Aggressive” in terms of sulfate content. It may be advisable to use sulfate resistant cement for below grade structures in the area represented by B-116.

We appreciate your selection of NOVA and the opportunity to be of service on this project. If you have any questions, or if we may be of further assistance, please do not hesitate to contact us.

Sincerely,  
**NOVA Engineering and Environmental, LLC**



Miguel Truzman, P.E.  
Senior Geotechnical Engineer  
Florida Registration No. 70766



Ken Houseman, P.E.  
Executive Vice President  
Florida Registration No. 43310

**PART 1 - GENERAL****1.01 SUMMARY**

- A. Scope of Work is to include all work shown on drawings and described in the Specifications.
- B. Related Work specified elsewhere includes but not limited to:
  - 1. Section 00500 - Stipulated Sum
  - 2. Section 00500 - Stipulated Sum Exhibit "F" : Benchmark Schedule
  - 3. Section 01300 - Submittals
  - 4. Section 01500 - Temporary Construction Facilities

**1.02 STIPULATED SUM REQUIREMENTS**

- A. Application For Payments
  - 1. Contractor shall provide all applications for payment following the requirement of Section 00500 - Stipulated Sum. Application for payments shall be submitted prior to the 28th of the month.
- B. Benchmark Schedule: Target dates for completion of construction phases to be inserted in Benchmark schedule per Section 00500 - Stipulated Sum Exhibit "F".

**1.03 SUBMITTALS**

- A. Refer to submittals Section 01300 for submittal requirements
- B. All submittals required by these Specifications shall be received by the Architect of Record within thirty (30) days of awarding of the contract unless otherwise noted.
- C. Precast concrete shop drawings shall be submitted within twenty one (21) days of awarding of the contract.

**1.04 TEMPORARY CONSTRUCTION FACILITIES**

- A. The following requirements shall be met per the requirements of Section 01500.
- B. If approved as alternate as outlined in section 01500, the Contractor shall provide a "Hiring Trailer" on the job site, for Home Depot use during construction, coordinating location and dates with Home Depot Project Manager. Contractor shall also provide an electrical hook-up (100 amp, verify) to the Job Site "Hiring Trailer", provide assistance for telephone installation, provide two (2) portable toilets, and a minimum of 30 parking spaces separated from main parking spaces.
- C. The Contractor shall provide separate, On-site Dumpsters for construction debris and for locally recyclable items.
- D. California Projects Only: The Contractor shall meet the requirements for recycling of the 2010 California Green Building Code of either Tier 1 that 65%, or Tier 2 that 80% of waste materials are recycled, dependant on local Tier requirements.

**1.05 OTHER REQUIREMENTS**

- A. Unless otherwise agreed upon by the Home Depot Project Manager, the Contractor and all subcontractors and suppliers shall purchase/deliver all general construction materials possible from existing Home Depot store outlets. The purchase of construction materials from other building material suppliers is not permitted under any circumstances. Refer to Attached Construction/Store Planning/Maintenance Letter
- B. The Contractor shall give all notices, provide all necessary coordination and comply with all ordinances and/or rules, regulations and lawful orders of any public utility or any authority having jurisdiction in rights-of-way or easements or within the boundaries of the site bearing on the performance of the work.
  - 1. The General Contractor and Sub-Contractors Foreman of all major trades shall walk the job with the Home Depot Representative, before the owner takes occupancy of the facility, and familiarize the owner with the operation of all equipment and controls associated with the facility.
- C. Contractor shall coordinate locating of gas, electric and telephone tie-ins with appropriate utility companies.
- D. Contractor shall build a concrete pad or enclosure for an electric transformer as per power company specifications. See electrical drawings for location. Contractor shall provide the necessary wiring from the electrical room to transformer and coordinate all work with Power Company. All electrical work shall comply with applicable codes.
- E. Contractor shall build a concrete pad for the propane tank and the emergency back-up generator per local jurisdiction and per Construction Documents.
- F. The contractor shall not drive or park heavy equipment on the building pad after certification, or on the concrete slab. Any damage to the pad or slab shall be replaced at the contractor's expense.

- G. The General Contractor shall clean up the parking lot two (2) days prior to the store opening, to meet the satisfaction of The Home Depot Project Manager.
- H. The General Contractor shall be responsible for all utilities prior to turnover date. After turnover date the General Contractor shall transfer utility account name over to The Home Depot U.S.A.
- I. General Contractor shall accept requests for extra work only from the Home Depot Project Manager.
- J. As soon as practical, the General Contractor shall secure all building openings.

**1.06 NOTICE OF CONSTRUCTION PROGRESS**

- A. Contractor shall notify Architect of Record five (5) working days prior to the following construction milestones:
  - 1. After roof structure is erected and before roofing is installed: Contractor shall arrange a structural punch before any roofing work is started.
  - 2. Punch: Substantial completion review prior to store fixturing. Verify readiness with the Home Depot Representative.
  - 3. Failure to notify the Architect of Record of any construction milestone may result in Contractor having to remove work for the purpose of inspection at the Contractor's expense.

- ATTACHMENTS FOLLOW -

**CONSTRUCTION / STORE PLANNING / MAINTENANCE**

The Home Depot Division  
2455 Paces Ferry Rd, NW  
Floor C-19  
Atlanta, GA 30339  
770.384.4442

Date: 04/02/18

To: General Contractor

Re: Stipulated Sum Contract Issued to General Contractors for:  
Store #0000 – Doral, FL

To Whom It May Concern:

It has been our policy to develop and maintain continuing relationships with our vendors. A business relationship must provide both partners with benefits. We do appreciate your efforts in maintaining our New Store schedules and keeping our costs as low as possible. In order to further strengthen our relationship, I request your assistance in maintaining a policy that will benefit both you the contractor and Home Depot.

Effective immediately, we expect you and your subs to purchase your material at The Home Depot. We will be competitive with your current suppliers and we will provide you with the correct materials when you need them. Please contact the Division Materials Point of Contact for Commercial Sales in order to develop a strong contractor/supplier relationship (contacts as listed in specification section 01012). Please provide a sub-contractor list to the commercial sales department so we can begin to establish this relationship. For all new Home Depot Store Construction, we expect to be the supplier as a minimum for the following materials:

Please advise me personally if you meet with any problems. Thank you for your efforts in maintaining our relationship.

Sincerely,  
THE HOME DEPOT

The Home Depot Construction Manager  
Director of Construction/Store Set-up/Maintenance

cc: District Manager

**Construction Specification****FURNISHED BY OWNER ITEMS (FBO)****PART 1 - GENERAL****1.01 GENERAL**

- A. The Home Depot has a National Accounts arrangement with the manufacturers of specific equipment as listed on drawings and/or in subsequent specification sections labeled "FBO". The Home Depot shall supply this equipment, with installation and all project management functions by the Contractor, as defined under this section and subsequent FBO sections. The Home Depot's sole involvement is submittal of purchase order. The Contractor shall cooperate with FBO vendors, and shall be responsible under this section to provide supervision, equipment, material storage and handling, or warranty for materials except when FBO items are installed by FBO Vendor. For items provided as FBO and installed by FBO Vendor, Contractor shall review and coordinate all modifications in FBO Documents that impact the scope of work for the Contractor.
- B. Contractor shall provide any non-factory related devices and accessories required to support, mount, set or install these components.
- C. Contractor shall include in his price, all labor and equipment rental necessary to completely install fixtures or equipment.

**1.02 VENDOR CONTACT**

- A. Contractor shall contact the FBO Vendor's National Account Representative twelve (12) weeks prior to scheduled installation of FBO Items, in writing using the attached "FBO Form A: Contractor Information Form". Contact information for each vendor is listed in each subsequent FBO specification section.
- B. The Vendor will maintain contact with the General Contractor to ensure compliance with the installation schedule.

**1.03 TAKEOFFS**

- A. A copy of the "bid set" construction documents will be posted to Exesite by the Architect of Record. National Account Representative will complete initial "take-off" indicating all materials to be shipped. The FBO Vendor's National Account Representative will confirm the order with Home Depot representative within thirty (30) days of the project bid date.
- B. Contractor will receive complete "take-off" indicating all materials to be shipped. Contractor is then responsible for confirming the submitted materials and quantities with the plans and specifications. A return confirmation must be sent back to National Account Representative for final coordination of package contents using the attached "FBO Form B: Take-Off Confirmation Sheet".
  - 1. Manufacturer is solely responsible for correctness of shipped materials and quantities.

**1.04 RECEIPT OF SHIPMENT**

- A. The Contractor shall be responsible for off loading, inspection, counting and checking shortages, storage, protection and insurance of all materials-supplied by FBO vendor.
  - 1. Contractor shall receive the equipment shipment at the site, review order for completeness, inspect all cartons and pallets for damage and correct labeling.
  - 2. Contractor shall check all materials and cartons or other containers for concealed damage.
  - 3. Contractor is responsible for identifying, processing, ordering and following shipment of all claims. Supplemental orders for replacement of shortages, damages or concealed damage materials must be made to the supplier within ten (10) days of the date of receipt of shipment at the job site. Claims submitted after the date will not be honored and will be considered lost or damaged at site, full replacement being the responsibility of Contractor.
  - 4. Contractor shall mark shortages and damaged materials on the receiving bill and attach a completed "FBO Form C: Confirmation of Shipment Form" with the supplemental order to manufacturer. The Contractor shall attach a copy of the receiving bill to the FBO Form C from the carrier and submit to the Contractor to forward to The Home Depot Project Manager, for his information. The FBO Form C shall include the cost of back shipment of damaged materials to manufacturer.
  - 5. Any materials broken or lost after receipt shall be replaced and the burden of cost placed on the Contractor.

**1.05 REQUEST FOR CHANGES AFTER INITIAL SHIPMENT**

- A. Changes to materials and quantities after receiving of shipment shall be coordinated by Contractor, (i.e., "Takeoffs") performed, equipment identified, counted and notification made to the FBO Vendor's National Account Representative. All Requests shall be submitted using the attached "FBO Form D: Request for Additional/Replacement Materials".
  - 1. The Contractor shall place requests for equipment through the FBO Vendor's National Account Representative immediately upon receipt of revised plans.
  - 2. Notification of equipment changes shall include quantity of additional equipment required or quantity of equipment not required.
  - 3. Associated changes in additional labor and components not provided by manufacturer shall be submitted to the Home Depot Project Manager for approval.
  - 4. Requests by Contractor for additional equipment from manufacturer are required to be approved by the Home Depot Project Manager.

**Construction Specification****FURNISHED BY OWNER ITEMS (FBO)****1.06 RETURNED MATERIALS (RMA)**

- A. Contractor shall return shipments of all unused materials back to the vendor whether furnished by the Contractor or furnished by Home Depot to the Contractor. Contractor shall submit "FBO Form E: Returned Materials" to the FBO Vendor's National Account Representative prior to shipment of materials.
1. Contractor shall obtain an RMA number from the FBO Vendor's National Accounts Representative.
  2. The FBO Vendor shall issue the return authorization to The Home Depot c/o the contractor at the job site per the information on the original request form. The vendor shall include a packing slip for returning the goods plus the local phone number of the carrier to be used for the return.
  3. Contractor shall keep equipment in original saleable condition, and properly identified packaging. Damaged material cannot be sent back.
  4. The contractor shall coordinate the pick up and return of the material.
  5. All store returns shall be shipped in the manner and location specified by the return authorization.
  6. The FBO Vendor's National Accounts Representative shall arrange necessary shipping back to manufacturer (if applicable).
  7. Upon receipt of the returned material at the specified location, the material shall be inspected to verify catalog numbers, counts and condition of product. Restocking and/or handling charges shall be determined at this time and the request for credit shall be processed. The Home Depot will be responsible for return freight charges and restocking charges as determined per their national account agreement.
  8. Each FBO Vendor's specific return requirements (if any) shall be stated in each subsequent FBO specification section.

**1.07 WARRANTY**

- A. Performance of warranty is by Contractor. Contractor is required to include all management and labor required to perform warranty work during warranty period, whether the materials are furnished by General Contractor or by The Home Depot.
- B. This warranty work will include defining warranty components, ordering warranty components, installing or reinstalling warranty components and all management and labor required to satisfy warranty issues.

END OF SECTION

Attachments:

FBO Form A: Contractor Information  
FBO Form B: Take-Off Confirmation Sheet  
FBO Form C: Confirmation of Shipment  
FBO Form D: Request for Additional/Replacement Materials  
FBO Form E: Returned Materials

**Furnished by Owner (FBO) Items  
Contractor Information Form**

Home Depot Address: \_\_\_\_\_

Store #: \_\_\_\_\_

HD Project Manager: \_\_\_\_\_

**Vendor Contact**

Vendor Name: \_\_\_\_\_  
Vendor Contact: \_\_\_\_\_  
Address: \_\_\_\_\_  
City, State: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Fax: \_\_\_\_\_  
E-mail: \_\_\_\_\_

**Contractor Contact**

Contractor Co: \_\_\_\_\_  
Attn: \_\_\_\_\_  
Address: \_\_\_\_\_  
City, State: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Fax: \_\_\_\_\_  
E-mail: \_\_\_\_\_

Important: The above job has been released to the vendor listed above for submittals and distribution. As called for in the bid documents, The Home Depot requires delivery requirements to be sent in writing to the vendor Account Representative listed above twelve (12) weeks prior to scheduled installation.

**1. Submittals**

Approved submittal packages including bill of material, specification sheets and product data sheets will be received by the general contractor through normal channels. Three (3) sets of submittals marked "advance copy only" will be sent directly to the contractor to familiarize them with basic requirements.

**2. Revisions to Plans**

Changes in plans can and most likely will cause a change in a previously established ship date.

**3. Changes in Construction Schedule**

Notification of delays and/or change from requested dates are to be forwarded to FBO Vendor two (2) weeks prior to the scheduled ship date to avoid additional handling or storage charges.

**4. Take-Off Confirmation**

Please make sure that you agree with the take-off provided by the vendor. If there is a discrepancy,

**please confirm within 10 days.**

Address the FBO materials are to be sent to:

\_\_\_\_\_  
\_\_\_\_\_

Attn: Job Foreman: \_\_\_\_\_

CALL 24 HR / CONTACT: \_\_\_\_\_ Phone: \_\_\_\_\_

**SHIPPING DATE REQUIREMENTS:**

FBO Item	Date needed at Job Site

FBO Item	Date needed at Job Site

Contractor Signature: \_\_\_\_\_ Date: \_\_\_\_\_





[illegible]

**Furnished by Owner (FBO) Items  
Confirmation of Shipment**

Home Depot Address: \_\_\_\_\_

Store #: \_\_\_\_\_

HD Project Manager: \_\_\_\_\_

Carriers Company Name: \_\_\_\_\_

Carriers Driver Name: \_\_\_\_\_

Vendor Providing Materials: \_\_\_\_\_

Vendor Account Rep: \_\_\_\_\_

Phone: \_\_\_\_\_

Sub-Contractor: \_\_\_\_\_

Phone: \_\_\_\_\_

General Contractor: \_\_\_\_\_

Phone: \_\_\_\_\_

☐ I hereby accept the counts provided by the carrier and agree they are accurate☐ The counts provided are not accurate. Below is a list of the discrepancy in the delivered material.

Quantity	Type	Catalog Number / Description

1. In the event the material delivered does not match the information provided in the Bills of Lading & packing, please contact the Vendor Account Representative as listed above.
2. All visible damage is to be record by photograph, documented on the Bill of Lading and sign for by the Trucking Company driver as an acknowledgement of seeing the damage only. All information is to be sent directly to the Vendor Account Representative listed above within 48 hours of the delivery. The General Contractor is then responsible to file the appropriate claim forms with the trucking firm. The vendor representative will also file the respective claim and work directly with the GC to resolve this issue. Unless these actions are taken by the GC to document to the claim, the referenced material and all products held on the Bill of Lading would become the full and unconditional responsibility of the GC.
3. By agreeing that the material shipped is accurate, any short material required is the responsibility of the contractor.
4. In the event there is concealed damage you have ten (10)-business days from the receipt of shipped material to file a claim with the vendor's Account Representative. You must provide the Bills of Lading and packing list when returning this document for processing

Contractor Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**Construction Specification****FBO FORM D: REQUEST FOR  
ADDITIONAL/REPLACEMENT FBO MATERIALS**

**Furnished by Owner (FBO) Items  
Request for Additional or Replacement FBO Materials**

Home Depot Address: \_\_\_\_\_

Store #: \_\_\_\_\_

HD Project Manager: \_\_\_\_\_

Vendor Providing Materials: \_\_\_\_\_ Phone: \_\_\_\_\_

Vendor Account Rep: \_\_\_\_\_ Fax: \_\_\_\_\_

Contractor Name: \_\_\_\_\_ Phone: \_\_\_\_\_

Quantity	Type	Catalog Number / Description	Reason for Request

Address the above materials are to be sent to: \_\_\_\_\_

Provide any special shipping instructions: \_\_\_\_\_

Attn: Job Foreman: \_\_\_\_\_

Contractor Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**Note: Special freight (Air, etc.) will require a signature from Home Depot for authorization.**

Home Depot Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**GC has ten (10) business days to file a concealed damage or short material claim with the factory.  
In the event a claim is filed after 10 business days, it is the responsibility of the GC to provide the  
said material.**



**Construction Specification****SPECIAL PURCHASE PROGRAM (SPP)****PART 1 - GENERAL****1.01 GENERAL**

- A. The Home Depot has a National Accounts arrangement with the manufacturers of specific equipment as listed on drawings. The Contractor must purchase products from the listed manufacturer or supplier, as defined under this section and subsequent SPP sections. The Contractor shall cooperate with SPP vendors, and shall be responsible under this section to provide supervision, equipment, material storage and handling, or warranty for materials. Contractor shall review and coordinate all modifications in SPP Documents that impact the scope of work for the Contractor.
- B. Contractor shall provide any non-factory related devices and accessories required to support, mount, set or install these components.
- C. Contractor shall include in his price, all labor and equipment rental necessary to completely install fixtures or equipment.
- D. Vendors will provide National Accounts pricing all on approved products as detailed by the specification. This pricing is applicable for all Home Depot new store projects and shall be consistent for all General Contractors.

**1.02 VENDOR CONTACT**

- A. Contractor shall contact the SPP Vendor's National Account Representative prior to scheduled installation of SPP Items per the requirements in each subsequent SPP specification section. Contact information for each vendor is listed in each subsequent SPP specification section.
- B. The Vendor will maintain contact with the General Contractor to ensure compliance with the installation schedule.
- C. The General Contractor will provide the following information:
  - 1. Job Name
  - 2. The Home Depot Store Number
  - 3. Contact name, telephone number, fax number, and/or email address
  - 4. The job address
  - 5. Purchase Order
  - 6. Scheduled date for start of product installation

**1.03 TAKEOFFS**

- A. An electronic copy of the "bid set" construction documents will be available to the National Account Representative through the Architect of Record. National Account Representative will complete initial "take-off" indicating all materials to be shipped. National Account Representative will confirm the order with Home Depot representative within 30 days of the project bid date.
  - 1. Contractor will receive complete "take-off" indicating all materials to be shipped. Contractor is then responsible for confirming the submitted materials and quantities with the plans and specifications. A return confirmation must be sent back to National Account Representative for final coordination of package contents.
  - 2. Manufacturer is solely responsible for correctness of shipped materials and quantities.

**1.04 RECEIPT OF SHIPMENT**

- A. The Contractor shall be responsible for off loading, inspection, counting and checking shortages, storage, protection and insurance of all materials whether supplied SPP to the Contractor or furnished by Home Depot for installation.
  - 1. Contractor shall receive the equipment shipment at the site, review order for completeness, inspect all cartons and pallets for damage and correct labeling.
  - 2. Contractor shall check all materials and cartons or other containers for concealed damage.
  - 3. Contractor is responsible for identifying, processing, ordering and following shipment of all claims. Supplemental orders for replacement of shortages, damages or concealed damage materials must be made to the supplier within ten days of the date of receipt of shipment at the job site. Claims submitted after the date will not be honored and will be considered lost or damaged at site, full replacement being the responsibility of Contractor.
  - 4. Contractor shall mark shortages and damaged materials on the receiving bill and attach a copy with the supplemental order to manufacturer. The Contractor shall attach a copy of the receiving bill to a claim form from the carrier and submit to the Contractor to forward to The Home Depot Project Manager, for his information. The claim shall include the cost of back shipment of damaged materials to manufacturer.
  - 5. Any materials broken or lost after receipt shall be replaced and the burden of cost placed on the Contractor.

**1.05 REQUEST FOR CHANGES AFTER INITIAL SHIPMENT**

- A. Changes to materials and quantities after receiving of shipment shall be coordinated by Contractor, (i.e., "Takeoffs") performed, equipment identified, counted and notification made to National Account Representative.
  - 1. The Contractor shall place requests for equipment through National Account Representative immediately upon receipt of revised plans.
  - 2. Notification of material changes shall include quantity of additional material required or quantity of equipment deleted.

**Construction Specification****SPECIAL PURCHASE PROGRAM (SPP)**

3. Any material deleted due to revised plans will be picked up by The Home Depot store shipping the material. Credit for the material will be applied to the account on which the material was purchased.

**1.06 RETURNED MATERIALS**

- A. Any unused material on the job may be returned for credit to the account on which the material was purchased.
  1. Contractor shall obtain an RMA number from National Accounts Representative.
  2. Contractor shall keep equipment in original saleable condition, and properly identified packaging. Damaged material cannot be sent back.
  3. National Accounts Representative shall arrange necessary reimbursement arrangements and shipping back to manufacturer.

**1.07 PAYMENT**

- A. General Contractor is held to the terms of Payment as outlined in the General Conditions. The General Contractor is responsible for securing method of payment for materials used on job. Payment must be secured through one of the following methods:
  1. Home Depot Commercial Credit Account provided by the Subcontractor
  2. Home Depot Commercial Credit Account provided by the General Contractor
  3. Other form of Credit Payment
  4. Cash
- B. If the Purchase Orders are not received in full and/or within the designated time period, General Contractor assumes all responsibility for the delay in the application of the paint, texture coating or any special coating on the job.

**1.08 WARRANTY**

- A. Performance of warranty is by Contractor. Contractor is required to include all management and labor required to perform warranty work during warranty period.
- B. This warranty work will include defining warranty components, ordering warranty components, installing or reinstalling warranty components and all management and labor required to satisfy warranty issues.

END OF SECTION

**Construction Specification****PREFERRED PURCHASING****PART 1 - GENERAL****1.01 SUMMARY**

- A. The Contractor and all subcontractors are encouraged to purchase all general construction materials possible from a local The Home Depot Store and rent equipment from a local The Home Depot Tool Rental. The purchase of construction materials from The Home Depot's retail competitors is not permitted under any circumstances.
- B. The Home Depot can provide quality materials at competitive pricing. If the Contractor asserts that The Home Depot pricing is not competitive, the Contractor must provide written evidence showing better pricing from another materials supplier. The Home Depot has the option of adjusting its pricing to a competitive level to encourage the contractor to purchase this material from The Home Depot.
- C. Contractor is prohibited from receiving deliveries on site from vehicles or in packaging bearing a retail competitor's name. Contractor is also prohibited from using rental equipment bearing a retail competitor's name and/or affiliate on the construction site.
- D. Related work specified elsewhere:
  - 1. See Below

**1.02 THE HOME DEPOT STORE CONTRACTOR SERVICES**

- A. Contact a local The Home Depot Store near the job site. Store locator is available at homedepot.com.
- B. Contractor shall submit a general construction schedule and a typed list of subcontractors with address and telephone numbers and name of principal contact to the local The Home Depot Store Contractor Services representative.
- C. The Home Depot Store Contractor Services representative, upon request, shall provide product data to Contractors for materials purchased from The Home Depot. This information shall include:
  - 1. Product identification, including manufacturers name and address.
  - 2. Manufactured literature shall highlight:
    - a. Product Description
    - b. Reference Standard
    - c. Performance and Test Data
  - 3. Refer to Section 01300 for submittal requirements
- D. The Home Depot Store Contractor Services representative will provide approved manufacturer contact information for specified materials not available from The Home Depot.
- E. Related sections with products available through The Home Depot Store Contractor Services include but are not limited to:
  - 1. Section 02721 - Storm Drainage System (Corrugated Polyethylene Pipe)
  - 2. Section 02960 - Landscape Irrigation
  - 3. Section 04200 - Brick Masonry (if applicable)
  - 4. Section 04230 - Reinforced Unit Masonry (if applicable)
  - 5. Section 05400 - Cold Formed Metal Framing
  - 6. Section 06100 - Rough Carpentry
  - 7. Section 06402 - Interior Architectural Woodwork
  - 8. Section 07201 - Building Insulation (batt insulation)
  - 9. Section 07270 - Firestopping
  - 10. Section 09260 - Gypsum Drywall
  - 11. Section 09300 - Tile
  - 12. Section 09510 - Acoustical Ceilings
  - 13. Section 09650 - Resilient Tile Flooring (if applicable)
  - 14. Section 09653 - Vinyl Base
  - 15. Section 09680 - Carpet (if applicable)
  - 16. Section 09900 - Painting
  - 17. Section 09985 - Fiberglass Reinforced Panels
  - 18. Section 10606 - Chain Link Fencing and Gates
  - 19. Section 16110 - Raceways
  - 20. Section 16120 - Wire and Cables
  - 21. Section 16125 - Low-Voltage Wiring
  - 22. Section 16130 - Outlet Boxes and Junction Boxes
  - 23. Section 16140 - Switches and Receptacles

**1.03 THE HOME DEPOT TOOL RENTAL**

- A. Contractors are encouraged to rent equipment from The Home Depot. Contractors are encouraged to reserve rental products (2) two weeks in advance of expected pick-up or delivery.



**Construction Specification****PREFERRED PURCHASING**

- B. Contact a local The Home Depot Tool Rental near the job site. Store locator is available at homedepot.com.

**1.01 PURCHASING**

- A. General Contractor is held to the terms of Payment as outlined in the General Conditions Section (Article 9.5). The General Contractor is responsible for securing method of payment for materials used on job. Payment must be secured through one of the following methods:
  - 1. The Home Depot Commercial Credit Account provided by the Subcontractor
  - 2. The Home Depot Commercial Credit Account provided by the General Contractor
  - 3. Other form of Credit Payment
  - 4. Cash
- B. Purchases will be tracked internally to insure compliance to this policy and provide better service.
- C. Contractors are encouraged to order products (2) weeks in advance of expected pick-up or delivery. Custom manufactured materials and market conditions can extend lead times. The Home Depot Store Contractor Services representative will provide estimated lead times upon request. Contractors are expected to place Purchase Orders in a timely manner that provides sufficient delivery lead time to match the construction schedule. Contractors are responsible for any construction delays due to late ordering.
- D. The Project Manager shall have the authority to reject any material, equipment, or workmanship not complying with these specifications and the Contractor shall replace defective work or material immediately upon notification of rejection. Any material so rejected shall be removed from the job within twenty-four (24) hours of such rejection; otherwise, the Owner may have same removed at this Contractor's expense.

**1.02 DELIVERY, STORAGE AND HANDLING**

- A. Materials shall be shipped directly to the job site from a manufacturer or from a local The Home Depot store.
- B. The General Contractor shall be responsible for off loading and initial storage and protection for all materials purchased from The Home Depot by the General Contractor and Subcontractors. The General Contractor is responsible for providing appropriate measures to unload the delivery truck within one (1) hour of its arrival. The delivery agent will provide a specific delivery time to allow the General Contractor to coordinate a method of receiving the delivery.
- C. Storage, protection, and insurance for all materials sent to job site is the responsibility of the General Contractor. The Home Depot store will arrange for delivery of all products to the job. There are two options for delivery to the job site:
  - 1. The selected The Home Depot store will receive the product from merchandise vendor. The store coordinates the delivery at no charge to the job site.
  - 2. The Home Depot will deliver products directly to the job site from a manufacturing facility at no charge to the Subcontractor.
    - a. In this case, the General Contractor is responsible for providing appropriate measures to unload the delivery truck within one (1) hour of its arrival. The Home Depot Store Contractor Services representative will provide a specific delivery time to allow the General Contractor to coordinate a method of receiving the delivery.
- D. The Materials Purchaser (General Contractor or Subcontractor) is responsible for inspecting, counting and checking shortages, storage, protection and insurance of all materials.
- E. The Materials Purchaser shall receive the materials at the site, review order for completeness, inspect all cartons and pallets for damage and correct labeling. The Materials Purchaser shall fax a signed copy of the Receiving Bill to The Home Depot Store Contractor Services representative who will then provide a key requisition number to the Materials supplier.
- F. The Materials Purchaser is responsible for identifying, processing, ordering and following shipment of all claims. Supplemental orders for replacement of shortages, damages or concealed damage materials must be made to The Home Depot Store Contractor Services representative within (10) ten days of the date of receipt of shipment at the job site. Claims submitted after that date will not be honored and will be considered lost or damaged at site, full replacement being the responsibility of the Materials Purchaser.
- G. The Contractor and a The Home Depot representative shall inspect materials claims.
- H. Any unused material on the job purchased from The Home Depot and drop shipped directly from the manufacturer may not be returned for credit. Materials shipped from a local The Home Depot may be returned to the same store for credit unless the material was special order.

**1.03 WARRANTY**

- A. Performance of warranty is by Contractor. Contractor is required to include all management and labor required to perform warranty work during warranty period.
  - 1. This warranty work will include defining warranty components, ordering warranty components, installing or reinstalling warranty components and all management and labor required to satisfy warranty issues.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

**PART 1 – GENERAL****1.01 GENERAL**

- A. The Home Depot has a National Accounts arrangement with specific fire / security alarm contractors. The alarm contractor will supply this equipment, with installation and all project management functions by the Alarm Contractor, as defined under this section and subsequent FBO sections. The Home Depot's sole involvement is submittal of the purchase order.
- B. The Alarm Contractor shall be responsible for offloading, counting, and checking shipping invoice, storage, protection, and insurance of all fire/security alarm equipment sent to the job site prior to installation by the Alarm Contractor.
  - 1. The Alarm Contractor shall receive the equipment shipment at the site or pre-determined location, review the order for completeness, inspect all cartons and pallets for damage and correct labeling.
  - 2. The Alarm Contractor shall inspect all materials and cartons or other containers for concealed damage.
  - 3. The Alarm Contractor is responsible for identifying, processing, ordering, and following the shipment of all claims. Replacement shall be the responsibility of the Alarm Contractor.
  - 4. The Alarm Contractor shall attach a copy of the receiving bill to the carrier claim form and submit to the Home Depot Project Manager for his/her information. The claim shall include the cost of return shipment of damaged materials.
  - 5. Any equipment broken or lost after receipt shall be replaced at the expense of the Alarm Contractor.
- C. All conduit, boxes (unless otherwise indicated on Telgian drawings), fittings, couplings, connectors, straps, supports, pull strings, bushings etc., shall be provided and installed by the alarm contractor.
- D. Alarm Contractor shall furnish all labor and equipment necessary to completely install fire / security alarm system components and cable per Telgian drawings.
- E. The Alarm Contractor shall coordinate with the Fire Sprinkler Contractor, the Fire Protection Engineer, the Electrical Contractor, and the Mechanical Contractor the proper installation of all components of the fire / security alarm system.
- F. The General Contractor shall request and receive from the project architect all building plans to use for coordination of all trades related to the Fire / Security Alarm System. These plans should be requested and reviewed at two separate times: (1) bid and (2) the start of construction.
- G. The General Contractor shall coordinate with all named parties to ensure that all dates and actions specified by the Benchmark Schedule (see attachment B) are maintained. Any variations shall be immediately communicated to the Fire/Security Alarm Contractor, the Architect, and the Home Depot Project Manager.
- H. The General Contractor shall contact the Fire/Security Alarm Contractor, eight (8) to ten (10) weeks prior to the scheduled installation of the fire alarm system, in writing on company letterhead. The letter shall include:
  - 1. Job name
  - 2. The Home Depot job number
  - 3. Contact name, telephone number, fax number, and e-mail address
  - 4. The job street address
  - 5. The exact date fire/security alarm system installation is to begin
- I. The Alarm Contractor is required to include all management required to perform warranty work during the warranty period. The Alarm Contractor is required to include all labor required to perform warranty work during the warranty period.
  - 1. This warranty work includes defining the warranty components, ordering warranty components, installing or reinstalling warranty components, and all management and labor to satisfy warranty issues.
- J. Changes to equipment and quantities after receiving the shipment shall be coordinated by the alarm contractor.
  - 1. Requests for equipment shall be placed by the alarm contractor immediately upon receipt of revised plans by the General Contractor from the Architect of Record.
  - 2. Notification of equipment changes shall include the quantity of additional equipment or quantity of equipment deleted.
  - 3. Associated changes in additional labor and material not provided by The Home Depot shall be submitted to the Home Depot Project Manager for approval.

- K. The alarm contractor shall coordinate all work necessary with all trades to provide a fully functional system, two (2) weeks prior to turnover. If the alarm contractor does not receive support from trades necessary to meet this requirement, the alarm contractor shall be responsible for notifying The Home Depot project manager, General Contractor and Telgian in writing.

END OF SECTION

**PART 1 - GENERAL****1.01 DESCRIPTION**

- A. Contractor's Project Manager will schedule and chair meetings, except as noted.
- B. Representatives of the Architect of Record when requested to do so by the owner shall attend; Contractor, Subcontractors and material suppliers attending project meetings shall have authority to make binding decisions for their respective firms.
- C. Progress meetings called by Contractor to coordinate and expedite work of Subcontractors and materials suppliers are not covered by this Section.

**1.02 PRE-CONSTRUCTION MEETING**

- A. Meeting shall be administered by the General Contractor.
- B. Contractor will schedule a pre-construction meeting.
- C. Attendees will include:
  - 1. Owner's Project Manager
  - 2. Architect of Record Representative.
  - 3. Contractor's Project Manager and Project Engineers.
  - 4. Contractor's Field Superintendent.
  - 5. Contractor's Safety Representative(s).
- D. Contractor: Shall make specified pre-construction submissions including following, if not already submitted:
  - 1. Typed list of Subcontractors with address and telephone number and name of principal contact.
  - 2. Certificate of Insurance.
  - 3. Construction Schedule.
  - 4. Schedule of Values.
  - 5. Building Permits.
- E. Agenda: Will include discussion of following items:
  - 1. Tentative Construction Schedule.
  - 2. Critical Work Sequencing.
  - 3. Designation of Responsible Personnel.
  - 4. Schedule for submittal of shop drawings, project data and samples.
  - 5. Processing applications for payment.
  - 6. Procedure for maintenance of record documents.
  - 7. Procedures for field changes, change estimates, change orders, etc.
  - 8. Use of premises.
  - 9. Location and maintenance of temporary storage buildings, field offices, etc.
  - 10. Site and Building Security Procedures.
  - 11. Safety and First Aid Procedures.
  - 12. Housekeeping Procedures.

**1.03 JOB SITE PROGRESS MEETINGS**

- A. Frequency: Periodic job site meetings will be held. The Contractor shall chair these. The meeting minutes shall be completed using Form A following this specification section.
- B. Attendees: Will Include:
  - 1. Owner's Representative:

**1.04 PRE-SLAB CONSTRUCTION MEETING**

- A. Meeting planned, hosted and attended by Contractor, except Structural Services Inc. (SSI) Representative will chair meeting. Schedule meeting between 7 and 14 days prior to first concrete interior slab placement of 10,000 SF or greater.
- B. Attendees:
  - 1. Owner's Project Manager or Representative
  - 2. SSI Representative (by teleconference or site visit)
  - 3. Independent Testing Contractor
  - 4. Contractor's Project Manager
  - 5. Contractor's Superintendent (who must be present during all major slab placements)
  - 6. Concrete Slab Sub-Contractor's Project Manager
  - 7. Concrete Slab Sub-Contractor's Finish Foreman (who must be present during all major slab placements)
  - 8. Concrete Supplier's Quality Control Representative (who must be present during all major slab placements)
  - 9. Base Fine Grading Contractor
  - 10. Liquid Surface Treatment Manufacturer's Representative

11. Liquid Surface Treatment Applicator and Polished Floor Surface Installer
  12. Joint Filler Manufacturer's Representative
  13. Joint Filler Sub-Contractor
- C. Require responsible representatives of each party involved with the concrete slab work to attend the meeting. Representatives to be present shall include personnel who are directly involved in overseeing the work and who have authority to control the concreting work.
- D. Contractor to call SSI (214-522-6438) two (2) weeks minimum prior to the proposed meeting date in order to finalize meeting date, agenda responsibilities, and other requirements.
- E. Notify all required attendees in writing of scheduled time and place at least two weeks in advance of meeting. Include copy of agenda with invitation. Submit record of notification of pre-slab construction meeting notice and agenda including company name, persons contacted, and date and method of contact.
- F. Submit copy of completed Pre-Slab Construction Meeting Agenda to all proposed meeting attendees at least one (1) week prior to meeting date.
- G. Submit meeting minutes and sign-in sheet to all participants and Owner's Project Manager within five (5) days after meeting.

**1.05 STRUCTURAL CONSTRUCTION OBSERVATIONS**

- A. Contractor to call Architect of Record's Project Manager one (1) week prior to the following construction phases:
1. Construction of Panels (if applicable).
  2. 75% completion of structural steel package and 50% completion of roof deck.
  3. 100% completion of all structural elements and prior to painting.
- B. Contractor to call SSI (214-522-6438) two (2) weeks minimum prior to proposed first major interior slab placement date to schedule SSI slab construction observation.

**1.06 PRE-ROOFING MEETING**

- A. Schedule job meeting to review roofing work, prior to actual installation.
- B. Attendees will include:
1. Owners Project Manager.
  2. Contractor's and Project Engineers.
  3. Contractor's Field Superintendent.
  4. Contractor's Sub-Contractors supplying items being reviewed. (Roofer, Steel, Sheet Metal etc.)
  5. Contractor's Safety Representative(s).
  6. Owner's Roofing Inspector.
  7. Manufacturer's Representative.
- C. Agenda: Will include discussion of following:
1. Review in detail manufacturer's requirements, specifications, roof plan, deck plan, insulation, roof drainage and flashing details, and other work related to roofing. Any anticipated or discovered conflict, incompatibility, or inadequacy shall be reviewed and resolved at the conference.
  2. Review in detail job conditions, schedule, construction sequence, requirements for application and quality of completed installation, and protection of adjacent work and property.
  3. Review in detail means of protecting the completed work during the remainder of the construction period.

**1.07 MONTHLY PROGRESS REPORTS**

- A. Contractor shall submit monthly progress reports with each application for payment. Progress report shall be submitted in bound report covers and shall include the following:
1. Report cover identifying the project, including:
    - a. Store name and address
    - b. Owner's store number
    - c. Date of report
    - d. Name of contractor and Contractor's Project Manager.

NOTE: Failure to submit progress report with Application for Payment will delay Application Approval.

2. Construction overview, including:
  - a. Summary of construction progress during the period covered by the respective application for payment.
  - b. Construction progress schedule per General Conditions.
  - c. Status of permit inspections.
  - d. Any delays encountered and proposed responses.
3. Progress photographs, including:

**Construction Specification**

**PROJECT MEETINGS**

- a. Minimum 3-1/2"x5" glossy color prints mounted on 8-1/2" bond for Owner's Project Manager. Color photocopies are acceptable for other copies.
  - b. Provide one photo showing an overview of the site, and other photos as required to provide an overview of construction progress, particularly of such stages as earthwork, utility installation, site work, floor slab pours, masonry or concrete wall, roof framing, roofing membrane, office package, and garden center as applicable.
- 4. Submit copies of each construction progress report as follows:
  - a. Owner's Project Manager: one copy with color photos.
  - b. Architect of Record: one copy.

**1.08 WEEKLY STATUS REPORTS**

- A. Contractor shall submit Weekly Status Reports. This Status Report shall be completed using Form B following this Specification Section and submitted using a Bound Report Cover.
  - 1. Submit a cover of the Weekly Status Report as follows:
    - a. Owners Project Manager: One (1) copy weekly
    - b. Architect of Record: One (1) copy weekly

PART 2 - PRODUCTS - NOT APPLICABLE

PART 3 - EXECUTION - NOT APPLICABLE

END OF SECTION

## PROGRESS MEETING NOTES

MEETING NO. \_\_\_\_\_

MEETING. DATE: \_\_\_\_\_

PROJECT:  
MEETING LOCATION:  
PREPARED BY:

Store #:

Name _____	Company _____	Name _____	Company _____	Name _____	Company _____
------------	---------------	------------	---------------	------------	---------------

IN ATTENDANCE:

## COPIES TO:

Attendees

## I. SCHEDULE DISCUSSION:

## II. PREVIOUS MINUTES:

ACTION	ITEM #	ITEM OF DISCUSSION:

## III. NEW MINUTES:

ACTION	ITEM #	ITEM OF DISCUSSION:

## IV. BULLETIN/ DCOP STATUS:

Bulletin #/ Description Bulletin Date	DCOP#	Date to HD	Date Approved



**Construction Specification****PROJECT MEETINGS-FORM A****V. MILESTONE DATES:**

	Description	Date to HD	Date Approved
1	Building Permit Pulled		
2	Begin construction		
3	Lucent Kick off Mtg.		
4	Ceiling Paint Complete		
5	Black Box Start Date		
6	Electrical Release		
7	Bailer/Compactor Due		
8	Check Stands Due		
9	Telephone Conduit Approved by LEC		
10	Telephone Activation (Live)		
11	Avaya Start Date		
12	Seal Slab		
13	Gas Co. Release		
14	Fan/Light Cloud Delivery		
15	Building Secured		
16	Fan/Light Cloud Electrical Complete		
17	Power to building complete		
18	Gas Meter Set		
19	Kitchen/Bath walls complete		
20	Substantial Completion		
21	Fire Dept. approval for Merchandise		
22	New Hire Trailer Arrival		
23	Power and Phone to New Hire Trailer		
24	Carpet Racks arrive		
25	Turnover		
26	Punch walk		
27	In Rack Sprinklers complete		
28	Merchandise Arrives		
29	File NOC		
30	Merch. Walk I		
31	Merch Walk II		
32	Certificate of Occupancy		
33	Contractor Night / Soft Opening		
34	Grand Opening		

## WEEKLY PROJECT STATUS REPORT

PROJECT DATA					HOT ISSUES	
Report #					City	
Project						
Date						
Store #						
Address						
Superintendent						
G.C.P.M.						
Current Fixture Plan Date					Consultants	
	Baseline	Current	Change Days Late (Early)			
PERMITS						
Demo						
Grading						
Bldg.					H.D.	
Racking						
MILESTONE DATES						
Site Start						
Bldg. Start						
Slab Complete						
Walls Tilted						
Roofing Complete					Contractor	
Permanent Power						
Telephone Entrance Cable						
Substantial						
Turnover						
TCO						
G.O.						
MEETINGS					Suppliers	
Pre Con.						
Pre Roof						
Lucent Kickoff						
Security Kickoff						
Punch						
SCHEDULE					PROGRESS REPORT	
	Percent Complete				Projected	
	0	25	50	75	100	Completion
SiteWork						
Off-site Work						
Slab						
Tilt Walls						
Roof Structure						
Roof Membrane						
Overhead Electrical						
Electrical						
Plumbing						
Mechanical						
Sprinklers						
Office Package						
Equipment Room						
Exterior Steel						
Exterior Finishes						
UTILITIES						
Water						
Gas						
Electrical						
Telephone						

**PART 1 - GENERAL**

- A. An Alternate is an amount proposed by Bidders and stated on the Bid Proposal Form for certain construction activities that may be added to or deducted from Base Bid amount if the Owner decides to accept a corresponding change.
- B. Coordination: Coordinate related Work and modify or adjust adjacent Work as necessary to ensure that Work affected by each accepted Alternate is complete and fully integrated into the project.
- C. Notification: Immediately following the award of the Contract, prepare and distribute to each party involved, notification of the status of each Alternate. Indicate whether Alternates have been accepted, rejected or deferred for consideration at a later date. Include a complete description of negotiated modifications to Alternates.
- D. Include as part of each Alternate, miscellaneous devices, accessory objects and similar items incidental to or required for a complete installation whether or not mentioned as part of the Alternate.

**PART 2 - PRODUCTS (Not Applicable)****PART 3 - EXECUTION (Not Applicable)****END OF SECTION**

**PART 1 - GENERAL****1.01 DESCRIPTION****A. Definitions:**

1. Samples: Physical examples prepared to illustrate materials, equipment or workmanship and to establish standards by which work will be judged as complying with contract requirements.
2. Shop Drawings: Drawings, diagrams, illustrations, schedules and performance charts, prepared to illustrate a portion of work in detail.
3. Product Data: Dated, printed literature of a product manufacturer that describes product and installation procedures. Product data may include test and performance data, illustrations, standard brochures and special details.
4. Submittals: General term including samples, shop drawings and product data, as applicable.

**B. General Provisions:**

1. Provisions in this section are mandatory procedures for preparing and submitting samples, shop drawings and/or product data.
2. As a minimum the Contractor shall submit product data, reports and shop drawings for review per the Shop Drawing / Submittal Logs at the end of this section.
3. Submittals shall be in orderly sequence and timed to cause no delay in the Work.
4. The Architect of Record or Civil Engineer shall receive all submittals required by these Specifications within thirty (30) days of awarding the contract unless otherwise noted.
5. Job delays occasioned by requirement of resubmission of samples, shop drawings and/or product data not in accord with Contract Documents are Contractor's responsibility and will not be considered valid justification for extension of contract time.
6. Commence no portion of work requiring submittals until submittal has been reviewed by the Architect of Record or Civil Engineer.

**C. Materials Requiring Submission for Information Only:**

1. Products that require selection of color or texture by the Architect of Record or Civil Engineer are excluded under this article.
2. Product data matching manufacturer, model, accessories and finish specified in the Contract Documents are not requiring shop drawings.
3. Manufacturer's literature shall substantiate compliance with requirements stated in contract documents.
  - a. Cover sheet identify name of project, the Architect of Record or Civil Engineer, Contractor and Subcontractor.
  - b. Product identification, including manufacturer's name and address.
  - c. Manufacturer's literature shall highlight specific items.
    - i. Product Description
    - ii. Reference Standard
    - iii. Performance and Test Data

**D. Architect of Record or Civil Engineer Duties:**

1. Architect of Record or Civil Engineer will review submission for compliance with specification.
2. If exception is noted, submission will be returned to contractor for full submittal.
3. If no exception is noted, information will be filed at the Architect of Record or Civil Engineer's office.

**1.02 SAMPLE PREPARATION**

- A. Prepare samples in sizes, shape and finish in accord with the provisions of individual specification sections.
- B. Samples furnished under this section are not to be confused with full size, on-the-site "Mock-Ups" called for in some specification sections.
- C. The number of samples submitted shall be the number required by Contractor, plus one (1) which will be retained by the Architect of Record or Civil Engineer, unless otherwise indicated.
- D. Samples shall be mailed to the Architect of Record or Civil Engineer at the same time as the submittal is posted to Expesite. Posted Submittal shall clearly indicate that a sample has been shipped.

**1.03 SHOP DRAWING PREPARATION****A. Drawings shall conform to the following requirements:**

1. Number drawings consecutively.
2. Indicate working and erection dimensions and relationships to adjacent work.
3. Show arrangements and section views, where applicable.
4. Indicate material, gauges, thicknesses, finishes and characteristics.
5. Indicate anchoring and fastening details, including information for making connections to adjacent work.

6. A written certification from the manufacturers that the material supplied to the project conforms to these specifications.

- B. Forms: Shop drawings requiring review by the Architect of Record or Civil Engineer shall be posted to Exesite as a "New Submittal" under Project Tasks in PDF file format. PDF file name shall include the store number, city and category of the submittal. Product Data for the same category shall be submitted under the same Submittal number on Exesite.

#### 1.04 PRODUCT DATA PREPARATION

- A. Include product manufacturer's standard printed material, dated, with product description and installation instructions indicated. Product data may also contain test and performance data, illustrations and special details.
- B. Form: Product Data requiring review by the Architect of Record or Civil Engineer shall be posted to Exesite as a "New Submittal" under Project Tasks in PDF file format. PDF file name shall include the store number, city and category of the submittal. Shop drawings for the same category shall be submitted under the same Submittal number on Exesite.
- C. Data not related to this project shall be deleted from manufacturer's standard data. Where multiple products or model numbers are represented on the same data sheet, the product or model numbers to be used in the project shall be highlighted or listed.

#### 1.05 CONTRACTOR'S REVIEW

- A. The General Contractor must review submittals and stamp with approval. Stamped approval must be done prior to any required submission to Architect of Record or Civil Engineer.
- B. The General Contractor is responsible to review and stamp with approval all other submittals required in each individual specification section as identified under the sub-section "SUBMITTALS TO CONTRACTOR".
- C. Schedule submittals with promptness and sequence as to cause no delay in the Work or in the work of the Owner or separate Contractors.
- D. By approving submittals, Contractor represents that he has determined and verified all materials, field measurements, quantities and field construction criteria related thereto, or will do so, and that he has checked and coordinated with information contained within such submittals with the requirements of the Work and of the Contract Documents. Contractor is responsible for selecting fabrication processes and techniques of construction.
- E. Where work is indicated "By others", Contractor shall indicate responsibility for providing and coordinating such work, whether by Subcontractors or under separate contracts.
- F. Contractor agrees that submittals processed by the Architect of Record or Civil Engineer are not Change Orders; that purpose of submittals by Contractor is to demonstrate that Contractor understands design concept; that he demonstrates his understanding by indicating which equipment and material he intends to furnish and install and by detailing fabrication and installation methods he intends to use.
- G. Contractor represents by submitting samples, shop drawings and product data that he has complied with provisions specified above. Submission made without Contractor's approval indicated thereon will be returned without being reviewed for compliance with this requirement.

Shop drawing submissions including data sheets, etc., shall have a reserved 6" x 6" space on the first page for the General Contractor and Architect of Record or Civil Engineer shop drawing review stamps and comments. Where such space is not available on printed documents/data sheet, General Contractor shall provide a separate 8-1/2 x 11 sheet with pertinent project data, including itemized list of products being submitted.

- H. Date each submittal and indicate name of Project, Architect of Record or Civil Engineer, Contractor, Subcontractor, as applicable, description or name of equipment material or product and identify location at which it is to be used in the Work.
- I. Contractor shall outline deviations, if any, in submittals from requirements of Contract Documents.
- J. No portion of the Work requiring submission of a shop drawing, product data or sample shall be commenced until the submittal has been approved by the Architect of Record or Civil Engineer as specified herein. All such portions of the Work shall be executed in accord with approved submittals.

#### 1.06 ARCHITECT OF RECORD'S REVIEW

- A. Architect of Record will only review submittals identified below in Submittal Log to Architect of Record and in each specification section identified under the sub-section "SUBMITTALS TO ARCHITECT OF RECORD". All other submittals will be returned to the contractor un-reviewed.
- B. An Architect of Record review is only for general conformance with the design concept of project and with information given in the Contract Document. Architect of Record review of a specific item shall not indicate approval of an assembly in which item is a component.
- C. Architect of Record review of submittals shall not relieve Contractor of responsibility for deviation from requirements of Contract

Documents unless Contractor has informed Architect of Record in writing of such deviation at time of submission and Architect of Record have given written approval to the specific deviation. Architect of Record review shall not relieve Contractor from responsibility for errors or omissions in submittals.

- D. Architect of Record will review each submittal, mark it with appropriate action, and return it to Contractor within one (1) week of receipt, except where it must be held for coordination, and the Contractor is so advised. Submittals will be marked by The Architect of Record as follows:
1. "FURNISH AS SUBMITTED/NO EXCEPTIONS TAKEN" indicates the submittals have been reviewed for general conformance with the design concept and no exceptions are taken.
  2. "FURNISH AS CORRECTED/MAKE CORRECTIONS NOTED" indicates contractor shall make corrections as noted on submittal.
  3. "REVISE AND RESUBMIT" indicates the submittals to be revised and resubmitted for review prior to proceeding with the work or that submittal does not comply with Contract Documents.
  4. "REJECTED" indicate the submittals do not comply with Contract Documents and are rejected.
  5. "SUBMIT SPECIFIED ITEM" indicates that samples of specified item shall be submitted in sizes, shapes and finish in accord with provisions of individual specification sections.
- E. Architect of Record will post a stamped and commented PDF under the same submittal task in Exesite. Architect will notify the Contractor upon posting of the reviewed submittal.

#### 1.07 CIVIL ENGINEER'S REVIEW

- A. The Civil Engineer will only review submittals identified below in Submittal Log to Civil Engineer and in each specification section identified under the sub-section "SUBMITTALS TO CIVIL ENGINEER". All other submittals will be returned to the contractor un-reviewed.
- B. A complete submittal package shall be sent to the Civil Engineer for his review. In addition, the Architect of Record shall be sent (1) copy of each submittal for his records. The submission to the Architect of Record shall be labeled "FILE COPY - NOT FOR REVIEW".
- C. Civil Engineer's review is only for general conformance with the design concept of project and with information given in the Contract Document. Architect's of Record review of a specific item shall not indicate approval of an assembly in which item is a component.
- D. Civil Engineer's review of submittals shall not relieve Contractor of responsibility for deviation from requirements of Contract Documents unless Contractor has informed Architect of Record and Civil Engineer in writing of such deviation at time of submission and Civil Engineer have given written approval to the specific deviation. Civil Engineer's review shall not relieve Contractor from responsibility for errors or omissions in submittals.
- E. Civil Engineer will review each submittal, mark it with appropriate action, and return it to Contractor within one (1) week of receipt, except where it must be held for coordination, and the Contractor is so advised. Submittals will be marked by The Architect of Record or Civil Engineer as follows:
1. "FURNISH AS SUBMITTED/NO EXCEPTIONS TAKEN" indicates the submittals have been reviewed for general conformance with the design concept and no exceptions are taken.
  2. "FURNISH AS CORRECTED/MAKE CORRECTIONS NOTED" indicates contractor shall make corrections as noted on submittal.
  3. "REVISE AND RESUBMIT" indicates the submittals to be revised and resubmitted for review prior to proceeding with the work or that submittal does not comply with Contract Documents.
  4. "REJECTED" indicate the submittals do not comply with Contract Documents and are rejected.
  5. "SUBMIT SPECIFIED ITEM" indicates that samples of specified item shall be submitted in sizes, shapes and finish in accord with provisions of individual specification sections.
- F. Civil Engineer will post a stamped and commented PDF under the same submittal task in Exesite. The Civil Engineer will notify the Contractor and Architect of Record upon posting of the reviewed submittal.

#### 1.08 RESUBMISSION

- A. Make corrections and changes indicated for submissions marked "Rejected" or "Revise and Resubmit" and resubmit in same manner as specified above, until submittals comply with Contract Documents.

#### 1.09 DISTRIBUTION

- A. Contractor is responsible for obtaining and distributing copies of submittals to his subcontractors and material suppliers after as well as before final approval. Prints of reviewed shop drawings shall be that carry the Architect of Record or Civil Engineer's appropriate stamp.
- B. Contractor shall maintain a file of reviewed submittals for duration of project, which shall be delivered to Owner as a part of project closeout documents.

**Construction Specification**

1.09 SUBMITTAL LOG FOR CIVIL ENGINEER

SHOP DRAWING / SUBMITTAL LOG					DATE RECEIVED and REVIEW COMMENTS					
Spec. Section	REQUIRED ITEMS	Shop Drawing	Product Data/Report	Samples	Date Received	Furnish as Submitted	Furnish as Corrected	Revise and Resubmit	Rejected	Submit Specified Item
02260	Modular Retaining Wall	X	X	X						
02920	Soil Preparation		X							
02960	Landscape Irrigation	X	X							

1.10 SUBMITTAL LOG FOR ARCHITECT OF RECORD

SHOP DRAWING / SUBMITTAL LOG					DATE RECEIVED and REVIEW COMMENTS					
Spec. Section	REQUIRED ITEMS	Shop Drawing	Product Data/Report	Samples	Date Received	Furnish as Submitted	Furnish as Corrected	Revise and Resubmit	Rejected	Submit Specified Item
02383	Drilled Piers (if applicable)	X	X							
03300	Cast In Place Concrete	X	X							
03390	Slab On Ground		X							
03410	Prestressed Precast Concrete Hollow Core Wall (if applicable)	X	X							
03470	Tilt Up Panels (if applicable)	X	X							
04200	Brick Masonry (if applicable)		X	X						
04230	Reinforced Unit Masonry (if applicable)		X	X						
05120	Structural Steel	X	X							
05210	Steel Joist Girders	X	X							
05220	Steel Joists	X	X							
05300	Steel Deck	X	X							
05300	Mechanical Fastener Layout and Design Data for Steel Deck (By General Contractor, if used)	X	X							
07240	Exterior Finish Insulation System (if applicable)		X	X						
07406	Metal Roof and Wall Panels	X	X	X						
07511	Built Up Roofing (if applicable)	X	X							
07901	Joint Sealers/Fillers		X	X						
08331	Overhead Coiling Doors	X	X							
08412	Aluminum Entrances and Storefronts	X	X							
09836	Textured Surface Coating (if applicable) (for non-standard colors only)			X						
09900	Painting (for non-standard colors only)			X						
15610	Unit Heater	X	X							
15625	Low Intensity Radiant Heaters	X	X							
15730	Rooftop Units	X	X							
15850	Fans	X	X							
15960	Energy Management Controls and Commissioning		X							
15990	Test, Adjust and Balance		X							

END OF SECTION

**Construction Specification****TESTING AND INSPECTION****PART 1 - GENERAL****1.01 SUMMARY**

- A. This section includes administrative and procedural requirements for code compliance, inspections and tests, and quality assurance.
- B. Owner will retain an Independent Testing Consultant (ITC) to perform project quality assurance and code compliance testing and inspection services for the following:
  - 1. Site Preparation (including SWPPP/NPDS compliance)
  - 2. Foundations
  - 3. Asphalt Paving
  - 4. Portland Cement Concrete Paving
  - 5. Interior Concrete Slab on Ground
  - 6. Concrete Tilt-Up Wall Panels
  - 7. Concrete Testing
  - 8. Structural Steel Framing
  - 9. Non-Shrink Grout
  - 10. Rack and Shelving Systems
  - 11. Masonry
  - 12. Painting and Textured Surface Coating
  - 13. SWPPP/NPDS compliance
  - 14. Effluent and Nutrient Testing
- C. There may be more than one ITC retained by the Owner to perform these services. The services of the ITC, and the information provided by the ITC, are provided for the sole benefit of Owner. The information is provided to Contractor only so the Contractor is aware of what is being reported to Owner and is not to be used in lieu of the Contractor's own quality control program. The Contractor shall not, and is not entitled to, rely upon any information provided by the ITC in any manner. Contractor is solely responsible for assuring that the Work complies with the Contract Documents in all respects and may not rely on the ITC for this, or any other, assurance. The ITC and its representatives are not authorized to revoke, alter, relax, enlarge or release any requirements of the Contract Documents, approve or accept any portion of the Work, perform or excuse any duties of Contractor, or be a party to the scheduling of the Work. The ITC is not an authorized agent of the Owner with respect to the relationship between Owner and Contractor.

**1.02 REFERENCED DOCUMENTS:**

- A. Specifications:
  - 1. 02051 Building Demolition (if applicable)
  - 2. 02200 Earthwork
  - 3. 02260 Modular Retaining Wall System
  - 4. 02370 Erosion and Sedimentation Control (including SWPPP)
  - 5. 02513 Asphalt Concrete Paving
  - 6. 02520 Portland Cement Concrete Paving
  - 7. 02550 Site Utilities
  - 8. 02721 Storm Drainage System
  - 9. 02810 Fine Grading, Temporary Grassing and Erosion Control
  - 10. 02920 Soil Preparation
  - 11. 03150 (FBO) Slab on Ground Accessories
  - 12. 03300 Cast-In-Place Concrete
  - 13. 03390 Slab on Ground
  - 14. 03470 Tilt-Up Panels (if applicable)
  - 15. 03600 Non-Shrink Grout
  - 16. 04100 Mortar and Grout (if applicable)
  - 17. 04200 Brick Masonry (if applicable)
  - 18. 04230 Reinforced Unit Masonry (if applicable)
  - 19. 05120 Structural Steel
  - 20. 05210 (FBO) Steel Joist Girders
  - 21. 05220 (FBO) Steel Joists
  - 22. 05300 (FBO) Steel Deck
  - 23. 05400 Cold Formed Metal Framing
  - 24. 05501 Metal Fabrications
  - 25. 05580 Sheet Metal Fabrications
  - 26. 07201 Building Insulation
  - 27. 07270 Firestopping
  - 28. 07406 Metal Roof and Wall Panels
  - 29. 07901 Joint Sealers-Fillers
  - 30. 09900 Painting



**Construction Specification****TESTING AND INSPECTION**

- B. American Association of State Highway and Transportation Officials (AASHTO):
    - 1. AASHTO T 318: Water Content of Freshly Mixed Concrete Using Microwave Oven Drying
    - 2. AASHTO Recommended Practice R-18, "Establishing and Implementing a Quality System for Construction Materials Testing Laboratories."
    - 3. AASHTO M288 Geotextile Specification for Highway Applications
    - 4. AASHTO Standard Specifications for Highway Bridges
  - C. American Concrete Institute (ACI):
    - 1. ACI 117: Standard Tolerances for Concrete Construction and Materials.
    - 2. ACI 301: Specifications for Structural Concrete.
    - 3. ACI 347R: Guide to Formwork for Concrete.
  - D. National Concrete Masonry Association (NCMA)
    - 1. NCMA Design Manual For Segmental Retaining Walls, Second Edition, Second Printing (1997)
    - 2. NCMA SRWU-2 Determination of Shear Strength Between Segmental Concrete Units
  - E. American Society for Testing and Materials (ASTM):
    - 1. ASTM C31: Making and Curing Concrete Test Specimens in the Field.
    - 2. ASTM C33: Concrete Aggregates.
    - 3. ASTM C39: Concrete Specimens, Compressive Strength of.
    - 4. ASTM C94: Ready-Mixed Concrete.
    - 5. ASTM C109: Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or 50-mm Cube Specimens)
    - 6. ASTM C136: Sieve Analysis of Fine and Coarse Aggregates.
    - 7. ASTM C172: Standard Method of Sampling Freshly Mixed Concrete.
    - 8. ASTM C702: Reducing Field Samples of Aggregate to Testing Size.
    - 9. ASTM C780: Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry
    - 10. ASTM C827: Test Method for Change in Height at Early Ages of Cylindrical Specimens of Cementitious Mixtures
    - 11. ASTM C1019: Method of Sampling and Testing Grout
    - 12. ASTM C1077: Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation
    - 13. ASTM C1090: Test Method for Measuring Change in Height of Cylindrical Specimens for Hydraulic-Cement Grout
    - 14. ASTM C1107: Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink)
    - 15. ASTM C1314: Standard Method for Constructing and Testing Masonry Prisms Used to Determine Compliance with Specified Compressive Strength of Masonry
    - 16. ASTM D75: Sampling Aggregates.
    - 17. ASTM D1188: Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Paraffin-Coated Specimens
    - 18. ASTM D1560: Standard Test Methods for Resistance to Deformation and Cohesion of Bituminous Mixtures by Means of Hveem Apparatus
    - 19. ASTM D2950: Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods
    - 20. ASTM D3549: Standard Test Method for Thickness or Height of Compacted Bituminous Paving Mixture Specimens
    - 21. ASTM D4125: Standard Test Methods for Asphalt Content of Bituminous Mixtures by the Nuclear Method.
    - 22. ASTM D4262: Standard Test Method for pH of Chemically Cleaned or Etched Concrete Surfaces
    - 23. ASTM D5444: Standard Test Method for Mechanical Size Analysis of Extracted Aggregate
    - 24. ASTM D6307: Standard Test Method for Asphalt Content of Hot-Mix Asphalt by Ignition Method.
    - 25. ASTM E18: Standard Test Methods for Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials
    - 26. ASTM E329: Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.
    - 27. ASTM E994: Laboratory Accreditation System.
    - 28. ASTM E1155: Standard Test Method for Determining Floor Flatness and Levelness Using the "F Number" System.
  - F. American Institute of Steel Construction (AISC): Code of Standard Practice for Steel Buildings and Bridges
  - G. American Welding Society (AWS):
    - 1. AWS D1.1: Structural Welding Code - Steel.
    - 2. AWS D1.3: Structural Welding Code - Sheet Steel.
    - 3. AWS D1.4: Structural Welding Code - Reinforcing Steel.
  - H. National Ready-Mix Concrete Association: NRMCA Inspection Standards.
  - I. Research Council on Structural Connections (RCSC): Specification for Structural Joints Using ASTM A325 or A490 Bolts.
- 1.03 SUBMITTALS
- A. ITC Qualifications:
    - 1. Minimum of 5 years of inspection and testing experience of equivalent type, size, and complexity of this Project. Provide

**Construction Specification****TESTING AND INSPECTION**

- list of 3 recently completed projects similar to Project complexity with full references, including addresses and telephone numbers of owners, architects, and contractors if requested by the Owner.
2. Submit personnel qualifications for personnel that will actually perform the inspections and testing. Personnel to have the following minimum qualifications:
    - a. Geotechnical:
      - i. Three years minimum experience for this type of work.
      - ii. Certified by the Department of Transportation in the state where the project is located.
      - iii. National Institute for Certification in Engineering Technologies (NICET) - Certification in Geotechnical Engineering Technology (Construction)
    - b. Storm Water Compliance
      - i. Minimum two (2) years Construction experience.
      - ii. Completed The Home Depot Storm Water Professional training program passing with a minimum grade of 75% within the last 12 months. Located at [www.stormwaterONE.com/company-training](http://www.stormwaterONE.com/company-training).
      - iii. Complete EVOCO tutorial on SWPPP inspection reports, if needed
      - iv. Completed State certification for SWPPP testing or inspection if required.
    - c. Concrete:
      - i. Three years minimum experience for this type of work.
      - ii. ACI Concrete Field Testing Technician – Grade I
      - iii. ACI Concrete Laboratory Testing Technician – Grade I
      - iv. International Code Council Certified (Formerly ICBO Certification)
    - d. Structural steel:
      - i. AWS Certified Welding Inspector (CWI)
      - ii. American Society of Nondestructive Testing (ASNT) Central Certification Program (ACCP) - Level II
    - e. Masonry:
      - i. Three years minimum experience for this type of work.
      - ii. International Code Council certified
    - f. Painting:
      - i. Three years minimum experience for this type of work.

**B. ITC Reports:**

1. The ITC to provide copies of reports and tests to those parties listed in this section. Promptly process and distribute all copies of test reports and related instructions to ensure that all necessary retesting and/or replacement of materials can be accomplished without possible delay to progress of the Work. Prepare and provide a written report within five (5) days related to every project test and inspection.

ITC shall post the report in PDF format to EXPESITE in the appropriate folder "J09 – Testing & Inspection Reports" and notify the HOME DEPOT PROJECT MANAGER, ARCHITECT, CONTRACTOR, CIVIL ENGINEER, and ARCHITECT'S structural engineer.

Distribute one (1) hard copy of the report to the Building Official when required for inspections / tests noted in Tables C1, S1, & M1.

2. Immediately notify the Owner's Representative and the Contractor both in writing and verbally of any inspections or tests that indicate non-conformance with the requirements of the contract documents.
3. ITC reports are to be on a form specifically designed for the inspections/testing being performed and are to include the "Logo" or letterhead of the ITC. The reports are to include as a minimum the following:
  - a. Date issued.
  - b. Building permit number.
  - c. ITC name, address and telephone number.
  - d. Project title, location and store number.
  - e. Name of ITC Inspector and certification number.
  - f. Date and time of testing or inspection.
  - g. Record of temperature and weather conditions.
  - h. Identification of drawings and specifications used for inspection/testing.
  - i. Location of inspection/testing related to the Project drawings.
  - j. Type of inspection/testing performed.
  - k. Interpretation of test results.
  - l. Include in each report written comments stating that the inspection/testing results comply with the specified requirements, and/or identify the remediation instructions given to the Contractor. The reinspection/retesting reports are to identify the original test report.
  - m. Inspection and test reports to be signed by the approved qualified personnel.
4. ITC to ensure a Geotechnical Engineer submits a letter stating the soil inspections/testing reports have been reviewed and the requirements of the Geotechnical Report have been met.
5. Reports to be available to the Building Official during the progress of the work and for two years after completion of the project.
6. At the completion of Project, the ITC principal is to submit a letter stating the following:
  - a. All required inspections and testing were performed.
  - b. All work inspected and tested conformed to the requirements of the contract documents.
  - c. All reports have been submitted and are true and correct.
7. At the completion of Project, submit by electronic means a complete copy of all inspections and testing daily reports,

**Construction Specification****TESTING AND INSPECTION**

- photos and correspondence. The electronic file format is to be Adobe Portable Document Format (PDF).
8. All Storm water reporting is to be done electronically in the EVOCO data management system.

## C. ITC Discrepancy Log:

1. Summary of inspections and tests reports of Work that was not in compliance.
2. Discrepancy Log is to be updated daily with reinspections/retesting of Work previously not in compliance.
3. Submit Discrepancy Log on a weekly basis minimum to the Owner's Representative and Contractor and indicate status of Work to be reinspected/retested.

## D. Storm Water Inspection Reports and Log of Tasks

1. Reports are housed in EVOCO data management system.
2. Log of Tasks to be updated weekly by General Contractor and monthly by ITC after site inspection.
3. Submit Discrepancy Log on a weekly basis minimum to the Owner's Representative and Contractor and indicate status of work to be re-inspected/retested.

## E. Effluent and Nutrient Testing Reports

1. Testing requirements listed in SWPPP Binder Section 1. Item G that meets type, frequency and reporting of State General Permit.
2. Reporting Logs are housed in Forms section of EVOCO data management system.
3. Reports are housed in EVOCO data management system, uploaded in file labeled Testing.

## F. Submit Commercial General Liability policy stating the Owner as an additional insured.

**1.04 QUALITY ASSURANCE**

## A. ITC Qualifications:

1. A company recognized in the industry as specialized for the type of inspections and tests being performed and complying with ASTM E994 and ASTM E329.
2. Participation in the National Voluntary Laboratory Accreditation Program (NVLAP).
3. The laboratory shall participate in the Cement and Concrete Reference Laboratory (CCRL) program and participate in the Sample Proficiency Program for concrete as required by Section 10.1.2 of ASTM C1077. The laboratory shall provide copies of the CCRL inspection report and corrections to all deficiencies and results of sample proficiency programs upon request.
4. A quality manual in use prepared in accordance with AASHTO Recommended Practice R-18.
5. Authorized to operate in the state in which the project is located.
6. Engineers are to be registered in the state where the project is located and have managerial responsibility over all operations.
7. Insurance Requirements:
  - a. ITC shall maintain worker's compensation and employer's liability insurance for its employees as required by state law. ITC shall effect and maintain, at its own expense, Commercial General Liability Insurance with a company licensed to do business in the state in which the services are to be performed with a financial rating of VIII or better and a policyholders rating of B+ or better in the latest edition of Best's Rating Guide on Property and Casualty Insurance Companies consisting of, at minimum, a policy with coverage of not less than \$1,000,000 per occurrence limit and with an aggregate limit of \$3,000,000 and Professional Liability insurance with limits of not less than \$2,000,000 with all policies having a deductible not to exceed \$25,000 without the express prior written consent of Owner and shall furnish Owner with a certificate to verify said insurance policies are in force prior to commencing any activity. Such Commercial General Liability policy shall name Owner as an additional insured. ITC shall be responsible for any and all claims, injuries or damages of any type whatsoever including, but not limited to, injuries to persons, property and loss of life, arising out of, relating to and due directly or indirectly from its services hereunder and shall indemnify, protect, defend and hold Owner harmless from any and all losses, damages or expenses (including attorney's fees) from any such claim, injury, damage or death, except as may be due solely to the negligent acts of the Owner. This indemnity shall survive the termination of this agreement.

## B. Regulatory Requirements:

1. In publications referred to, advisory provisions are considered to be mandatory as though the word "shall" has been substituted for "should" whenever it appears.
2. Industry publications governing this Work are of latest issue at date of this Specification release except as otherwise noted.

**1.05 RESPONSIBILITIES:**

## A. Architect of Record Responsibilities:

1. Ensure the ITC has the most current set of design drawings, shop and fabrication drawings, specifications, concrete and grout mix designs, asphalt mix designs, non-FBO roofing shop drawings and RFI's prior to starting work for that particular inspection/testing. Ensure all shop drawings and mix designs have the Architect of Record's approval stamp.

## B. ITC Responsibilities:

1. Cooperate with the Contractor and schedule work activities with the Contractor. ITC is to notify Contractor when inspection/testing are completed.
2. Ensure the approved qualified personnel perform the Work.
3. Contact the Architect of Record to determine and obtain the most current set of design drawings, shop and fabrication drawings, specifications, concrete and grout mix designs, asphalt mix designs, non-FBO roofing shop drawings and RFI's prior to starting work for that particular inspection/testing. Ensure all shop drawings and mix designs have the Architect of Record's approval stamp.
4. Inspect and/or test materials, assemblies, specimens, work performed, including methods and techniques as shown on the design drawings, shop and fabrication drawings, specifications and RFI's.
5. Inspections/testing noted in this Specification are minimum requirements. Verify if the local governing authorities require more stringent inspections/testing and perform those inspections/testing requirements.
6. Promptly notify the Owner's Representative and Contractor of observed non-compliance irregularities or deficiencies in work.
7. Maintaining the Discrepancy Log of Work that is not in compliance.
8. Take digital photos of the major activities, any items of potential claims or as requested by the Owner's Representative.
9. The ITC is not authorized to waive, release, revoke, alter or enlarge on the requirements of Contract Documents.
10. The ITC is not authorized to perform any duties of the Contractor.
11. Submit reports as specified. One copy of the daily field reports is to be kept in a folder in the trailer of the General Contractor.
12. Review soils/earthwork change order request as directed by the Owner's Representative.

## C. Contractor Responsibilities:

1. Cooperate with the ITC and schedule work activities with the ITC so that no Work is installed without the proper inspections/tests being performed. Notify the ITC a minimum of 48 hours in advance of operations to allow for ITC assignment of personnel and scheduling of test.
2. Work is not to proceed until the ITC has completed inspection/testing for that portion of Work and results are acceptable.
3. Contractor to provide to ITC equipment and labor for inspecting elevated portions of Work and obtaining samples at the project or at other sources of materials.
4. Provide and maintain a location in the trailer for a folder with the ITC daily field reports.
5. Pay for cost of required laboratory testing of concrete mix designs, mortar and grout mix designs, and asphalt mix designs.
6. Furnish copies of mill test reports of all shipments of cement, reinforcing steel, and structural steel to the Architect of Record and the ITC as required.
7. Make arrangements and schedule the proper governing authorities for inspection of the system and verify with governing authorities the proper test procedures that are required for the system or work being inspected.
8. Provide and maintain for the sole use of ITC, adequate facilities for safe storage and proper curing of concrete test cylinders on project site for the first twenty-four (24) hours as required by ASTM C31.
9. The Contractor will be responsible to remove and replace unsuitable foundation bearing surfaces or water-saturated soils resulting from the Contractor failure to fill the excavation or provide adequate protection, at the Contractor's expense.
10. Ensure parts of structure that fail testing are corrected as directed by Owner's Representative at no additional cost and without extension of Contract time.
11. When results of required inspections/tests or similar services, prove unsatisfactory and indicate non-compliance of related work with the requirements of the Contract Documents, at the Owner's discretion, the costs of reinspections/retests associated with that non-compliance may be deducted by the Owner from the Contract Sum.
12. Is responsible for any testing requirements of retaining walls during construction and testing for design of walls in section 3.01.

## 1.06 PAYMENT FOR ITC SERVICES

- A. The specified testing and inspection services to be paid for by Owner.
- B. When the initial inspection/tests indicate non-compliance with the Contract Documents, all subsequent retesting occasioned by the non-compliance is to be performed by the same ITC and paid for by Owner. ITC is to identify and invoice separately for reinspections/retesting and the OWNER shall use that separate invoice for reinspections/retesting to obtain reimbursement by the CONTRACTOR.

## PART 2 - PRODUCTS - NOT APPLICABLE

## PART 3 - EXECUTION

## 3.01 RETAINING WALL DESIGN TESTING REQUIREMENTS

## A. Minimum of the following tests:

1. Perform a minimum of three (3) soil test borings along wall location or at least one (1) soil test boring every 50 linear feet of wall. The soil test borings should be extended to 1.5 times the wall height or minimum of 20 feet below the existing ground surface.
2. Collect a minimum of four (4) bulk samples or one (1) bulk sample for every 1,000 cubic yards of the proposed on-site

**Construction Specification****TESTING AND INSPECTION**

- backfill materials to be utilized within the reinforced zone.
- 3. The following tests should be performed on the proposed reinforced fill materials.
  - a. Standard Proctor Tests (ASTM D-698)
  - b. Sieve Analysis (ASTM D-698)
  - c. Remolded Triaxial Shear Test (ASTM D-4767)
  - d. Atterberg Limits Test (ASTM D-4318)

**3.02 GENERAL**

- A. General Testing: As directed by Owner's Representative, inspect/test selected items such as reinforcing steel, aggregates, structural steel, masonry and other products suspected of not meeting specified requirements to verify compliance. Provide inspection/test reports to Owner's Representative.
- 1. Allowable Tolerances:
  - a. Formwork: Conform to most stringent requirements of ACI 117, ACI 301, and ACI 347R, except as specified herein.
  - b. Items Other Than Formwork: Conform to ACI 117, except as specified.

**3.03 SITE PREPARATION**

- A. General:
  - 1. Prior to beginning site construction, the General Contractor will schedule a pre-construction site meeting/conference, call the earth work subcontractor, Geotechnical Engineer, Civil Engineer, all site disturbing Sub Contractors and the ITC to review site construction requirements and discuss all pertinent issues that could affect the project schedule and cost. Site construction discussion items are to include as a minimum the following:
    - a. Certifying that all BMP's are in place and correct per the SWPPP documents on a site walk/walks with the General Contractor's Superintendent, and the preparer of the SWPPP prior to starting any site work other than that necessary for the placement of those BMP's.
    - b. Certifying that all NOIs, Permit Authorization and additional permits are posted at the entry.
    - c. Verifying all other storm water items included in the Pre-Construction Checklist located in Specifications Section 02370 are completed.
    - d. Site preparation clearing, grubbing and demolition.
    - e. Site grading, cut and fill operations, and fill materials.
    - f. Earthwork compaction and Geotechnical Report's recommendations.
    - g. Utility installation, pipe bedding and trench backfill.
    - h. Excavation and backfill operations and fill materials.
    - i. Site drainage, erosion and sediment control, and storm water management.
  - 2. When actual site conditions are found by the ITC to be at variance with the Geotechnical Report, immediately notify the Owner's Representative, Civil Engineer and Architect in writing and verbally. No further work, except for safety precautions, is to be executed in the affected portion of the site until a resolution is obtained
- B. Site preparation Work items:
  - 1. Site preparation stripping, grubbing and demolition activities to be observed continuously by the ITC to ensure compliance with the Geotechnical Report recommendations. ITC to include as a minimum in their daily observation reports the following:
    - a. Site stripping and grubbing operations.
    - b. Site improvement items scheduled for demolition or to be grouted in place.
    - c. Below grade site improvement items scheduled for removal, such as foundations, septic fields and similar items.
    - d. Below grade site improvement items uncovered during construction that are required to be removed or relocated to accommodate new construction.
- C. Soils/Earthworks Work items:
  - 1. ITC to ensure subgrade compaction and moisture conditioning is in compliance with Geotechnical Report recommendations prior to the installation of fill and backfill materials. ITC to indicate approval of subgrade compaction and moisture conditioning in the daily report.
  - 2. The ITC is to observe continuously all fill and backfill operations.
  - 3. The ITC is to ensure all fill and backfill operations are performed in accordance with the Geotechnical Report or government agency having jurisdiction, whichever is most stringent. The ITC to include as a minimum in their daily reports the following:
    - a. Confirmation that the proper fill material as determined by the Geotechnical Engineer is being used.
    - b. The maximum lift thickness for the fill material complies with the Geotechnical Report.
    - c. The ITC to perform type of soil density test and frequency as noted in the Geotechnical Report. ITC to note results of inspections/testing along with their locations (including coordinates and elevations) in the daily reports. As a minimum, density tests are to be done as follows:
      - i. Mass Grading: one test per 5000 square feet per lift.
      - ii. Under Building Slab on Ground: one test per 2500 square feet per lift.
      - iii. Backfilling Behind Retaining Walls: one test per 100 linear feet of wall per lift.
      - iv. Utility Pipe and Structures Backfill: one test per 100 linear feet of trench per lift.

**Construction Specification****TESTING AND INSPECTION**

- v. Concrete Curbs and Sidewalks: one test per 500 linear feet.
  - d. The ITC is also to verbally notify immediately the Owner's Representative and Contractor if soil density noted in the Geotechnical Report is not being achieved and indicate possible causes of non-compliance.
- 4. ITC to ensure a Geotechnical Engineer reviews the inspections/testing reports and verifies the requirements of the Geotechnical Report have been met.
- 5. ITC to ensure site drainage is in conformance with the Contract Documents. ITC to note in daily reports locations of low site areas that do not drain and are continuously holding water. ITC is also to verbally notify the Owner's Representative and Contractor of these problem areas.
- 6. The ITC is to indicate in the daily reports that the Contractor is in compliance with the erosion and sedimentation control plan and observe the on-site erosion and sedimentation control materials and installation measures for compliance with the project requirements. When non-compliant items are observed, verbally notify the Owner's Representative and Contractor. The Owner and ITC will not be held responsible for NPDES violations due to the Contractor's failure to provide and maintain erosion and sedimentation controls during construction acceptable to the governing authorities.
- 7. The ITC is to indicate in the daily report that the type of aggregate base and thickness meets the project requirements. As a minimum, the following tests are to be performed:
  - a. One gradation test per type of aggregate
  - b. One density test per 5000 square feet per lift
  - c. Verify aggregate base thickness per 5000 square feet just prior to placement of slab or pavement.
- 8. The ITC is to inspect/test the building slab and pavement soil subgrade just prior (within 24 hours but preferably less) to aggregate base placement by proof rolling. The ITC is to inspect/test the aggregate base just prior (within 24 hours but preferably less) to placing the building slab or pavement by proof rolling. Proof rolling is to be done by a large dump truck (or other vehicle acceptable to the ITC) provided by the Contractor. The ITC to ensure the subgrade or aggregate base does not deflect more than 1/2" during the proof rolling. Contractor to repair soft areas as directed by the ITC. The ITC is to indicate in the daily reports the proof rolling verified the subgrade and base was acceptable.
- 9. The ITC is to indicate in the daily report that the vapor barrier/retarder is the proper type and is installed correctly. The ITC to verify that all punctures are properly repaired and jointing and lapping are done properly.
- 10. For other specialized site preparation requirements such as soil stabilization, etc. the ITC is to coordinate with the Geotechnical Engineer for the inspections/testing requirements.
- D. Storm Water Compliance
  - 1. Technician to take and pass The Home Depot Storm Water Professional training.
  - 2. Technician to take and pass any State certification for SWPPP testing or inspection if required.
  - 3. Technician to take tutorial on records and data management from EVOCO.
  - 4. Technician to verify that the General Contractor has made all repairs and corrections to Tasks in the Log of Tasks and, if not, to instruct General Contractor as to needed actions.
  - 5. Technician is to walk with General Contractors Superintendent on weekly inspections.
  - 6. Verify that SWPPP is updated weekly.
  - 7. Review SWPPP binder on site and make sure all relevant documents are collected.
  - 8. Verify that all NOI's Permit Authorizations and other required permits are posted on site.
  - 9. Technician is to do a monthly SWPPP inspection included in Section 02370, and add any item for repair or improvement to the Log of Tasks.
  - 10. In addition, the ITC shall ensure that, to the extent practicable, all inspections at a Site are conducted by the same Inspector.
  - 11. Technician is to take all Effluent or Nutrient tests required by permitting agency listed in SWPPP Binder Section 1. Item G.

**3.04 FOUNDATIONS**

- A. Inspections/testing to occur just prior to placing concrete. ITC to include as a minimum in the daily report the following for each foundation:
  - 1. Verify soil bearing capacity and compaction requirements.
  - 2. Verify foundation excavations for proper bearing elevation, plan size and depth.
  - 3. Verify reinforcement type, size, number of bars, and locations.
  - 4. Verify anchor bolt type, size, number of bolts, length, elevations and locations.
  - 5. Verify the proper concrete mix is being placed.
  - 6. Verify the concrete testing as noted below is performed.
  - 7. Verify that each delivery ticket has the additional information required by ASTM C94 which includes quantities of all material batched including the amount of free water in the aggregate and also the quantity of water that can be added at the site without exceeding the maximum water cement ratio specified. ITC to verify the amount of water added at the site.
  - 8. Verify the proper finishing and curing requirements have been used.
- B. For other specialized foundation systems such as drilled piers, piling, stone columns, dynamic compaction, etc. the ITC is to coordinate with the Geotechnical Engineer for the inspections/testing requirements.

**3.05 ASPHALT PAVING**

- A. ITC to include as a minimum in the daily report the following:
  - 1. Verify the following for the asphalt mix design prior to asphalt placement:
    - a. The asphalt mix design has been approved and signed by a professional engineer in the state in which the project is

- constructed.
- b. The asphalt mix design specifies the minimum relative compaction and the methods required to determine maximum density.
- 2. Verify the subbase and aggregate base have been proof rolled as noted above.
- 3. Inspect/test base course material for in-place density and thickness as noted above. Test material for gradation classification, and physical properties when the material is specified to meet specific bearing requirements.
- 4. Inspect/test asphalt wearing course material for compaction during placement and conduct thickness measurements during lay-down. Take temperature of the asphalt mixture and compare actual temperature with the approved asphalt mixture design range. As a minimum, perform the following inspections/tests:
  - a. Collect trip tickets from trucks delivered to the site and verify correct mix design being used for the project.
  - b. Temperature tests: one per truck
  - c. Lay down thickness (uncompacted): one per strip or 500 square feet minimum.
  - d. Verify equipment rolling pattern and passes to ensure proper compaction: one per day.
  - e. Density test (daily lab density): one test per 5000 square feet minimum or more often if required by the approved asphalt mix design.
  - f. Hot mix samples (laboratory testing for asphaltic concrete content per ASTM D4125 or D6307, gradation per ASTM D5444, bulk stability per ASTM D1560, and density per ASTM D1188): one per day.
  - g. Thickness per ASTM D3549 and density samples per ASTM D2950 by a properly calibrated nuclear asphalt testing device. The thickness of the combined courses shall meet or exceed the indicated thickness. If there is disagreement between samples done by ASTM D2950 and ASTM D1188, the values done by ASTM D1188 will govern: one test per 20,000 square feet (surface lift), one test per 10,000 square feet (base lift)
  - h. Verify compaction at the joints and seams. The completed paved surface to be true to grade and cross section. Verify smoothness by using an unleveled 10 foot straightedge and ensuring no gap at any point between straightedge and pavement exceeds 1/4 inch except at intersections or at changes of grade. Tolerances shall not exceed:
    - i. Base Course Surface 1/4-inch
    - ii. Wearing Course Surface 1/8-inch
  - i. Coring Frequency: Asphalt surface and base courses shall be randomly cored at minimum rate of 3 cores per day's placement per mix type, but not less than 3 cores in light duty areas and 3 cores in heavy-duty areas shall be obtained. Asphalt concrete paving samples shall be tested for conformance with density and thickness requirements. Cores shall be cut from minimal loading areas representative of project. Coring holes shall be immediately filed by the Contractor with full-depth asphalt concrete.
- 5. The screed/lay down thickness tolerance shall be between 1/8 to 3/16 inches greater than the required asphalt minimum layer requirement. When screed depth is set for the exact thickness as specified, immediately notify the Owner's Representative and Contractor that the installed asphalt thickness may be deficient to achieve the specified minimum thickness. Identify areas of non-complying thickness and attach a drawing identifying the areas to the daily field report.
- 6. Immediately notify the Owner's Representative and Contractor when paving is being conducted in cold weather and asphalt temperatures are below or above the design mix range.
- 7. Identify on a drawing all paved areas that are holding water after asphalt placement and notify the Owner's Representative and Contractor for determination of removal and replacement, or repair.
- 8. Verify tack coat and edge coat have been applied at the proper rate.

### 3.06 PORTLAND CEMENT CONCRETE PAVING

#### A. ITC to include as a minimum in the daily report the following:

- 1. Verify the subbase and aggregate base have been proof rolled as noted above.
- 2. Verify the skim coat of fine aggregate base is placed on top of the coarse aggregate base and the surface is smooth and planar immediately prior to placing concrete.
- 3. Verify the pavement tolerances conform to ACI 117 and ACI 347R, except as noted below:
  - a. Pavement base fine grade: +0, -3/4" with transition no greater than 3/4 inch vertically to 8 inches horizontally for design grade of pavement base.
  - b. Average pavement thickness tolerance: -0"
  - c. Minimum pavement thickness tolerance: -3/4"
  - d. Ensure at least 85% of the concrete pavement area will have a thickness that exceeds the thickness that is shown on the drawings minus 1/2 inch. Thickness samples are to be randomly located from each placement of concrete pavement and not exceed 1000 square feet of pavement surface area.
  - e. Pavement surface: maximum gap of 5/16" at any point between an unleveled 10 ft. straightedge and the pavement, anywhere on the pavement. Measure within 72 hours after pavement placement.
- 4. Verify reinforcement type, size, number of bars, and locations. Verify re-entrant corner and discontinuous slab joint reinforcement has been properly installed.
- 5. Verify the locations of joints and proper dowel type, size, number, elevations and locations.
- 6. Verify the proper approved concrete mix is being placed.
- 7. Verify the concrete testing as noted below is performed.
- 8. Verify the concrete is mixed and transported in accordance with ASTM C94 except reduce maximum discharge time to 75 and 60 minutes for air temperatures of 85-90 and 90 F, respectively.
- 9. Verify that each delivery ticket has the additional information required by ASTM C94 which includes quantities of all material batched including the amount of free water in the aggregate and also the quantity of water that can be added at the site without exceeding the maximum water cement ratio specified. ITC to verify the amount of water added at the site.
- 10. Verify the proper finishing and curing requirements have been used. Verify that the Owner's Representative has approved

- the texture of the broom finish.
11. Verify joints have been cut on time, have the proper depth and cut with the proper saw cutting equipment.
  12. Verify the proper joint sealant is being installed as specified.
  13. Identify on a drawing all non-complying areas and notify the Owner's Representative and Contractor.

### 3.07 INTERIOR CONCRETE SLAB ON GROUND

A. ITC to include as a minimum in the daily report the following:

1. Verify that the Check-Off List has been signed off as being completed.
2. Verify the test slab has been placed and is acceptable to the Owner's Representative.
3. The subbase and aggregate base have been proof rolled as noted above.
4. Verify the skim coat of fine aggregate base is placed on top of the coarse aggregate base and the surface is smooth and planar immediately prior to placing concrete.
5. Verify the slab tolerances conform to ACI 117 and ACI 347R, except as noted below:
  - a. Slab base fine grade: +0, -3/4" with transition no greater than 3/4 inch vertically to 8 inches horizontally for design grade of slab base.
  - b. Average Slab on Ground thickness tolerance: -0 inch
  - c. Minimum slab on ground thickness tolerance: - 3/4 inch
  - d. Ensure at least 85% of the slab on ground will have a thickness that exceeds the thickness that is shown on the drawings minus 1/2". Thickness samples are to be randomly located from each slab placement **from test areas not to exceed 1000 square feet of slab surface.**
  - e. For floor finished surface flatness and levelness conform to F-number requirements noted below and as described in ASTM E1155:
    - i. FF50/FL35 minimum overall for composite of all measured values, FF35/FL24 minimum for any individual floor sections. Also ensure top of entire slab falls within +3/4" of finished floor elevation shown on the drawings, unless floor is shown to be sloped.
      - a) Bound individual floor sections for testing purposes by the following that provide the smallest sections: construction joints, contraction joints, or column and half-column lines.
    - ii. Additional Requirements.
      - a) Conform to F-numbers specified for floor areas within 2 feet of construction and isolation joints, in lieu of ASTM E1155 requirements excluding these areas.
      - b) Limit to 1/4 inch maximum elevation change that may occur within 2 feet of vertical elements (such as columns or walls) that pass through or adjacent to slab surface.
6. Verify reinforcement type, size, number of bars, and locations. Verify re-entrant corner and discontinuous slab joint reinforcement has been properly installed.
7. Verify the locations of joints and proper dowel type, size, number, elevations and locations. Verify the locations of joints and proper dowel type, size, number, elevations and locations. Verify the Diamond Dowels at the construction joints are properly aligned using the Diamond Dowel Alignment Template.
8. Verify the proper approved concrete mix is being placed.
9. Verify the concrete testing as noted below is performed.
10. Verify the concrete is mixed and transported in accordance with ASTM C94 except reduce maximum discharge time to 75 and 60 minutes for air temperatures of 85-90 and 90 F, respectively.
11. Verify that each delivery ticket has the additional information required by ASTM C94 which includes quantities of all material batched including the amount of free water in the aggregate and also the quantity of water that can be added at the site without exceeding the maximum water cement ratio specified. ITC to verify the amount of water added at the site.
12. Verify the proper finishing and curing requirements have been used.
13. Verify joints have been cut on time, have the proper depth and cut with the proper saw cutting equipment.
14. Joint Filling/Sealing:
  - a. ITC to provide continuous inspection of joint filling/sealing operations.
  - b. Verify the joints have been cleaned and dried immediately prior to filling/sealing joints.
  - c. Verify that joint filler is being used in the contraction and construction joints and joint sealant is being used in the isolation joints.
  - d. Verify joint back-up material (i.e., backer rod, sand, etc.), is not being used except below bottom of sawcut in construction joints. Testing will be performed by Home Depot Independent Testing Consultant (ITC) at no expense to the Contractor. A test report of all measurements and a plan and table of the measurements taken will be prepared for submission.
15. Test Interior Sales Floor Slab for gloss as follows:
  - a. Gloss measurements to be taken independent of ambient lighting and to be taken within a sealed measurement window located beneath the test unit. The measurements are to be made using a Horiba IG-320 Gloss Checker.
  - b. Record measurement locations and value on copy of the floor plan.
  - c. Collect a minimum of three (3) random measurements per sample area.
  - d. Sample areas to be bounded by column lines.
  - e. Ensure the Specified Overall Gloss Value (SOGV)  $\geq 40$  and Minimum Local Gloss Value (MLGV)  $\geq 25$
  - f. The SOGV is determined by the average of all measurements for a sample area.
  - g. No single measurement in a sample area is to be less than the MLGV.
  - h. If the SOGV for a sample area is less than specified and no single value was below the MLGV, collect an additional 3 measurements at evenly distributed random locations and recalculate the SOGV using all measured values.
  - i. Perform gloss measurements no earlier than 3-days prior to rack installation. Perform one follow-up test for each sample area that does not meet the gloss requirements after contractor performs corrections.



**Construction Specification****TESTING AND INSPECTION**

16. Identify on a drawing all non-complying areas and verbally notify the Owner's Representative and Contractor.

**3.08 CONCRETE TILT-UP WALL PANELS**

- A. ITC to include as a minimum in the daily report the following:
  1. Verify the wall panel tolerances conform to ACI 117 and ACI 347R.
  2. Verify reinforcement type, size, number of bars, and locations. Verify re-entrant corner reinforcement has been properly installed.
  3. Verify the proper approved concrete mix is being placed.
  4. Verify the concrete testing as noted below is performed.
  5. Verify the concrete is mixed and transported in accordance with ASTM C94 except reduce maximum discharge time to 75 and 60 minutes for air temperatures of 85-90 and 90 F, respectively.
  6. Verify that each delivery ticket has the additional information required by ASTM C94 which includes quantities of all material batched including the amount of free water in the aggregate and also the quantity of water that can be added at the site without exceeding the maximum water cement ratio specified. ITC to verify the amount of water added at the site.
  7. Verify the proper curing and finishing requirements have been used.
  8. Identify on a drawing all non-complying areas and verbally notify the Owner's Representative and Contractor.

**3.09 CONCRETE TESTING**

- A. Perform inspections/tests noted in table C1 and provide inspection/test reports.
- B. Concrete Plant Certification: Certify primary and secondary plants proposed for furnishing concrete as being approved at highest level by NRMCA or by Department of Transportation in state where project is located.
- C. Truck inspection requirements: Inspect ready-mix concrete trucks proposed for slabs, pavements and tilt-up wall panels.
  1. Conform to ASTM C 94, NRMCA, or Department of Transportation standards in state where project is located.
  2. Perform inspections immediately before starting those concreting operations, but not more than three days prior to concrete placement.
  3. Make a visual inspection of the trucks and a visual inspection of the mixing drums from the discharge opening to look for worn mixing fins and excess concrete accumulation.
  4. Record acceptable trucks numbers, and notify Owner's Representative and Contractor if any other truck attempts to deliver concrete for slabs, pavements and tilt-up wall panels.
- D. For slabs and pavements, perform slump and temperature tests for first truckload of concrete and every sixth truck minimum thereafter and provide reports.
- E. For troweled finish slabs, perform air test for first truck and every sixth truck minimum thereafter and provide reports. Reject concrete if air content is over 3%. Immediately notify Owner's Representative and Contractor if concrete is rejected for high air content.
- F. When mid-range or high-range water-reducing admixture is added on-site to produce slumps in excess of that for concrete without noted admixture, take additional slump tests as follows and provide test reports:
  1. Take 1 from first batch before admixture is added.
  2. Take 1 from first batch after the admixture is added and mixer has revolved number of turns recommended by admixture manufacturer.
  3. After first batch, take 1 from every sixth batch minimum before admixture is added.
- G. When pumping concrete, take samples for tests at point of delivery from pumping line, in addition to first slump test noted above for concrete with mid-range or high-range water-reducer and provide test reports.
- H. Perform additional testing for concrete used in slabs and pavements as follows and provide test reports:
  1. Immediately before first concrete production and later as directed by Owner's Representative, take samples at concrete plant of aggregate size groups used in pertinent mix to verify mix design submittals. Take samples from bins as close as possible in time and space to their introduction into mixer. Concrete supplier and aggregate producer to have representatives available to assist ITC in obtaining representative samples. Perform sieve analyses on each aggregate size group, using sieve sizes specified. Provide following test data: percent passing each sieve, cumulative percent retained on each sieve, percent retained on each sieve, fineness modulus, and combined sieve analysis of material retained on each sieve for aggregates. Conform to ASTM C136, C702, and D75. As compared to approved concrete mix design, of total combined coarse and fine aggregates, ensure within tolerance for material retained on any 1 sieve of -2% and +3% of approved mix design amount, except No. 100 sieve. Ensure within tolerance for material retained on No. 100 sieve of + 1% or -1%.
- I. During first day of concrete placement and later as directed by Owner's Representative, take concrete sample at point of final placement to verify mix design submittals. Washout sample to remove material finer than No. 200 sieve and perform combined sieve analysis, using sieve sizes specified, furnishing percent retained on each sieve. Ensure concrete sample size is large

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**Construction Specification****TESTING AND INSPECTION**

enough to be representative but is not less than 70 pounds. Conform to ASTM C136. As compared to approved concrete mix design, of total combined coarse and fine aggregates, ensure within tolerance for material retained on any 1 sieve of -3% and +4%, except No. 100 sieve. Ensure within tolerance for material retained on No. 100 sieve is +2% or -2%.

- J. Determine concrete mix water content for first placement of slab and pavement. This test is to be done first by the concrete supplier and then at the project site by the ITC. The ITC to provide report and verbally notify the Owner's Representative and Contractor as soon as possible but no later than end of same day.

1. Conform to AASHTO T318
2. Sample size to be a minimum of 2500g.

TABLE C1		
DESCRIPTION OF VERIFICATION AND INSPECTION WORK	INSPECTION FREQUENCY	REFERENCED STANDARD
1. Inspection of reinforcing steel and placement.	CONTINUOUS	ACI 318: Ch 3.5, 7.1-7.7
2. Inspection of reinforcing steel that is welded	See Steel Special Inspection Requirements	See Steel Special Inspection Requirements
3. Inspect bolts to be installed in concrete prior to and during placement of concrete	CONTINUOUS	
4. Verifying use of approved design mix	CONTINUOUS	ACI 318: Ch. 4, 5.2-5.4
5. Test concrete materials for compressive strength, air content, temperature, and slump in accordance with ASTM C31 and C39. Frequency of testing to be as follows: A. Once each day a given class is placed, nor less than B. Once for each 100 cubic yards of each class placed each day, nor less than C. Once for each 5000 square feet of each class for slabs, pavements or walls surface area placed each day. In calculating surface area, only one side of the slab, pavement or wall is to be considered. D. When specified schedule of testing provides less than 5 sets of tests for a given class of concrete for all placements, test at least 5 randomly selected batches; if fewer than 5 batches are used, test each batch. E. Include test cylinders for each compressive strength test to be tested as follows: 1. For 28 day design age strength: 1 at 7 days, 2 at 28 days, 1 reserve.	CONTINUOUS	ASTM C 172 ASTM C 31, C39 ACI 318: Ch 5.6, 5.8
6. Inspection of concrete placement for proper conveying and depositing techniques.	CONTINUOUS	ACI 318: Ch 5.9, 5.10
7. Inspection for maintenance of specified curing temperature and cold and hot weather requirements and techniques.	CONTINUOUS	ACI 318: Ch 5.11-5.13
8. Erection of precast concrete members.	CONTINUOUS	ACI 318: Ch. 16
9. Make and test additional test cylinders for determining starting times for formwork removal, reshores removal, putting structures into service, etc. Field-cure test cylinders in environment as close as possible to that of structure(s) concerned. Make, cure, and test cylinders in accordance with ASTM C31 and C39. Determine number of additional field-cured test cylinders required, coordinate with ITC and submit number to Owner's Representative for concurrence.	PERIODIC	ASTM C 31, c39 ACI 318: CH 6.2

**Construction Specification****TESTING AND INSPECTION****3.10 STRUCTURAL STEEL FRAMING****A. General:**

1. Ensure welds and fasteners that fail testing are corrected as directed by Owner's Representative at no additional cost and without extension of Contract time. If 5% of the tested welds or bolts fail, additional testing to be done as required by Owner's Representative.
2. Welds are to be tested and inspected in accordance with AWS D1.1.
3. High strength bolts to be tested and inspected in accordance with RSCS.
4. ITC to verify shop and field welding is being done by AWS certified welders. If required, qualify shop and field welders in accordance with AWS D1.1 for all types of welds required to complete this portion of Work. Conduct examinations by an approved recognized agency staffed and equipped for such purposes. Qualify each welder prior to starting to weld.

**B. Shop Inspection and Testing:**

1. Perform inspections/tests noted in Table S1 and provide inspection/test reports. Testing noted in Table S1 is not required where the work is done on the premises of a fabricator registered and approved by the Building Official to perform such work without special inspection. At completion of fabrication, the approved fabricator shall submit a certificate of compliance to the Building Official stating that the work was performed in accordance with the approved construction documents.
2. If steel is used from a source in United States, mill tests alone are acceptable. If foreign steel is used, ITC is to test steel as directed by Owner's Representative to verify that steel meets specified ASTM requirements. ITC to provide report.
3. ITC is to conduct ultrasonic or radiographic tests in shop. Fabricator's quality control may do this testing if acceptable to the Building Official and approved by Owner's Representative. Test the require amount and frequency of complete joint penetration groove welds required by the local governing building authority. As a minimum, test at least 25% of complete joint penetration groove welds and welds noted on Drawings. Test entire length of weld in each splice tested. Mark names of inspector and welder on each joint inspected. Provide test reports.
4. ITC is to inspect and test welds of shear connectors and other types of studs in accordance with AWS D1.1. Provide test reports.

**C. Field Inspection and testing:**

1. Perform inspections/tests noted in Table S1 and provide inspection/test reports.
2. Collect random samples of high strength bolt assemblies at Project site and test them for compliance with specified requirements. Perform initial testing before starting steel erection. Also, perform testing during erection. Test bolts for hardness per ASTM E18 at a rate of 1 bolt assembly per 150 bolts. Check lot numbers on containers against certification furnished. Do not start installation of bolts until initial testing is complete and acceptable to Owner's Representative. Ensure each fastener component (bolt, nut, and washer) is from same lot and manufacturer. Provide test reports.
3. ITC is to inspect and test welds of shear connectors and other types of studs in accordance with AWS D1.1. Provide test reports.
4. ITC to inspect mechanically fastened steel deck (when used):
  - a. Review the Mechanical Fastener Layout and Design Data Submittal with the A/E's approval stamp.
  - b. Participate in the pre-deck installation meeting with General Contractor, Sub-contractors, and Mechanical Deck Fastener Manufacturer's Representative.
    - i. Ensure the Mechanical Fastener Manufacturer's Representative identifies the different fasteners and where they are to be used. The mechanical fasteners should be color-coded or have some means for easy recognition once installed.
    - ii. Ensure the Mechanical Fastener Manufacturer's Representative trains the installers on the installation procedures and how to recognize fasteners that are properly set as well as fasteners that are improperly set.
    - iii. Inspect the Contractor's tools and equipment to be used for the installation with the Mechanical Fastener Manufacturer's Representative. Reject the use of any tools or equipment that do not meet the Mechanical Fastener Manufacturer's requirements.
  - c. Inspect the mechanically fastened deck installation for conformance to the approved submittal.
    - i. 95% of the fasteners shall be properly installed.
    - ii. Improperly installed fasteners should be random and located remote from each other.
    - iii. Clusters of improperly set fasteners shall be identified for corrective action.
  - d. Provide inspection reports.

**Construction Specification****TESTING AND INSPECTION**

<b>TABLE S1</b>		
<b>DESCRIPTION OF VERIFICATION AND INSPECTION WORK</b>	<b>INSPECTION FREQUENCY</b>	<b>REFERENCED STANDARD</b>
1. Material verification of high-strength bolts, nuts, and washers: A. Identification markings to conform to ASTM standards specified in the approved construction documents. B. Manufacturer's certificate of compliance required.	PERIODIC	Applicable ASTM material specifications; AISC ASD, Section A3.4
2. Inspection of high-strength bolting; A. Snug-tightened joints B. Pre-tensioned or Slip-Critical Joints 1. Turn-of-nut with match marking 2. Direct tension indicator 3. Twist-off bolt 4. Turn-of-nut without match marking 5. Calibrated Wrench	PERIODIC  PERIODIC PERIODIC PERIODIC CONTINUOUS CONTINUOUS	RCSC
3. Material verification of structural steel: A. Identification markings to conform to ASTM standards specified in the approved construction documents. B. Manufacturers' certified mill test reports required.	All steel	ASTM A 6 or ASTM A 568  ASTM A 6 or ASTM A 568
4. Material verification of weld filler materials: A. Identification markings to conform to AWS specification in the approved construction documents. B. Manufacturer's certificate of compliance required.	All weld filler materials	AISC, ASD, Section A3.6
5. Inspection of welding: A. Structural steel 1. Complete and partial penetration groove welds 2. Multi-pass fillet welds 3. Single-pass fillet welds greater than 5/16" 4. Single-pass fillet welds less than or equal to 5/16" 5. Steel deck welds a. Deck pre-installation meeting B. Reinforcing steel: 1. Verification of weldability of reinforcing steel other than ASTM A706. 2. Reinforcing steel-resisting flexural and axial forces in intermediate and special moment frames, and boundary elements of special reinforced concrete shear walls, and shear reinforcement. 3. Shear reinforcement. 4. Other reinforcing steel.	CONTINUOUS  CONTINUOUS CONTINUOUS  PERIODIC  PERIODIC ONCE  PERIODIC  CONTINUOUS   CONTINUOUS PERIODIC	AWS D1.1       AWS D1.3  AWS D1.4 ACI 318: Ch 3.5.2
6. Inspection of steel frame joint details for compliance with approved construction documents: A. Details such as bracing and stiffening. B. Member locations. C. Application of joint details at each connection.	PERIODIC	
7. Inspections for mechanically fastened steel deck (when used): A. Review the Mechanical Fastener Layout and Design Data Submittal with AE's approval stamp. B. Deck pre-installation meeting C. Inspect the mechanically fastened deck installation	ONCE  ONCE PERIODIC	

**Construction Specification****TESTING AND INSPECTION****3.11 NON-SHRINK GROUT**

- A. ITC to include as a minimum in the daily report the following:
1. Verify areas to receive grout are prepared per the manufacturer's recommendations.
  2. Verify grout is proportioned, mixed, and placed per the manufacturer's instructions.
  3. Verify grout is cured as specified or per the manufacturer's instructions.
- B. ITC to shall secure composite samples and test grout in accordance with the cited standards. Take a sample of the grout used at least once each day grout work occurs. A minimum of four test specimens shall be prepared for each test to be performed. Unless otherwise specified perform tests at 1 day, 3 days, 7 days, and 28 days.
1. Report test results as previously stated.
- C. Identify on a drawing all non-complying areas and verbally notify the Owner's Representative and Contractor.

**3.12 RACK AND SHELVING SYSTEMS**

- A. ITC to review the permit for this element of work and verify that the requirements of the permit relative to special inspection are performed.
- B. ITC to verify that rack and shelving fabricator has quality control procedures that are acceptable to the local governing building authority.
- C. ITC to continuously inspect the installation of the anchor bolts for the rack and shelving system and provide reports.

**3.13 MASONRY**

- A. Perform inspections/tests noted in Table M1 and provide inspection/test reports.
- B. Perform the following material testing and provide reports.
- C. Initial testing to be done prior to masonry construction:
1. Testing of Mortar: ASTM C780 for consistency, mortar aggregate ratio, water content, air content, and compressive strength.
  2. Testing of Grout: ASTM C1019
  3. Prism Test: ASTM C1314
  4. Field testing to be done for each 5000 square feet of wall area or portion thereof. Test to be done at least once per day if less than 5000 square feet of wall is installed in one day.
    - a. Testing of Mortar: ASTM C780 for consistency, mortar aggregate ratio, water content, air content, and compressive strength.
    - b. Testing of Grout: ASTM C1019
    - c. Prism Test: ASTM C1314

<b>TABLE M1</b>			
<b>DESCRIPTION OF VERIFICATION AND INSPECTION WORK</b>	<b>INSPECTION FREQUENCY</b>	<b>REFERENCED STANDARD</b>	
		<b>ACI 530/ ASCE 5/ TMS 402</b>	<b>ACI 530.1/ ASCE 6/ TMS 602</b>
1. From the beginning of masonry construction, the following shall be verified to ensure compliance: A. Proportions of site-mixed mortar and grout. B. Placement of masonry units and construction of mortar joints. C. Placement of reinforcement and connectors. D. Grout space prior to grouting. E. Placement of grout.	PERIODIC  PERIODIC  PERIODIC CONTINUOUS CONTINUOUS	Ch. 8	Art. 2.6A Art. 3.3B  Art. 3.4 Art. 3.2D Art. 3.5

**Construction Specification****TESTING AND INSPECTION**

<b>TABLE M1</b>			
<b>DESCRIPTION OF VERIFICATION AND INSPECTION WORK</b>	<b>INSPECTION FREQUENCY</b>	<b>REFERENCED STANDARD</b>	
		<b>ACI 530/ ASCE 5/ TMS 402</b>	<b>ACI 530.1/ ASCE 6/ TMS 602</b>
2. The inspection program shall verify: A. Size and location of structural elements. B. Type, size and location of anchors, including other details of anchorage of masonry to structural members, frames or other construction. C. Specified size, grade and type of reinforcement. D. Welding of reinforcing bars. E. Protection of masonry during cold weather (temperature below 40°F) or hot weather (temperature above 90°F).	PERIODIC  CONTINUOUS	Sec. 1.15.4, 2.1.2	3.3G
	PERIODIC	Sec. 1.12	Art. 2.4, 3.4
	CONTINUOUS CONTINUOUS	Sec. 8.5.7 and Sec. 8.5.7.2	Art. 1.8
3. Prior to grouting, the following shall be verified to ensure compliance: A. Grout space is clean. B. Placement of reinforcement and connectors. C. Proportions of site-prepared grout D. Construction of mortar joints.	PERIODIC PERIODIC PERIODIC PERIODIC	Sec. 1.12	Art. 3.2D Art. 3.4 Art. 2.6B Art. 3.3B
4. Grout placement shall be verified to ensure compliance with code and construction document provisions.	CONTINUOUS		Art. 3.5
5. Preparation of any required grout specimens, mortar specimens and/or prisms shall be observed.	CONTINUOUS		Art. 1.4
6. Compliance with required inspection provisions of the construction documents and the approved submittals shall be verified.	PERIODIC		Art. 1.5

**3.14 PAINTING AND TEXTURED SURFACE COATING****A. Pre-Painting Meetings:**

1. The paint manufacturer's Representative to conduct a pre-painting meeting.
2. Attendance designated by the ITC and Owner's Representative and to include the following: General Contractor, Painting Contractor, and paint manufacturer's technical representative.
3. Representatives to be present are personnel who are directly involved in Project and who have authority to control Work.

**B. Inspection of Surfaces Prior to Painting:**

1. Prior to painting Primer Coat, provide testing reports for EACH exterior wall panel consisting of the following:
  - a. PH Testing: PH levels shall be 10 or below in accordance with ASTM D4262 prior to the application of first paint coat.
  - b. That the surface has no grease, oils, bond breaker, curing compound, dirt or dust.

**C. Verify that dry film thickness of applied coatings complies with specification requirements by use of a Tooke Gauge or other equivalent equipment approved by the Owner's representative.**

1. Provide testing reports for the following:
  - a. Verify proper type of paint and thickness of deck painting
    - i. Select on a random basis a minimum of 1 per 10,000 square feet of area
  - b. Verify proper type of paint and thickness of structural steel painting
    - i. A minimum of 1 per column and 1 per 25 joists or rolled shape beam.
  - c. Verify the proper paint is applied on galvanized steel.
  - d. Verify the bond breaker has been completely removed prior to painting tilt-up wall panels.
  - e. Verify all exposed to view surfaces and surfaces not exposed to view have been painted.

**D. Provide full time observation of the application of the "Orange Band" on the exterior of the building and ensure that the application is performed as specified in Specification Section 09900 – Painting.**

END OF SECTION

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**Construction Specification****ROOFING TESTING AND INSPECTION SERVICE**

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**PART 1 - GENERAL****1.01 DESCRIPTION**

- A. The Roofing Testing and inspection Service shall be contracted directly with Owner.
- B. The extent of Roofing Testing and Inspection Service is specified in this Specification section.
- C. Familiarity with Roofing Requirements: In addition to the inspector's knowledge and expertise in the areas of roofing, he should also familiarize himself with the following:
  - 1. National, State, and local codes and regulations. Underwriters Laboratories and Factory Mutual's various fire, wind, and building classifications. Roofing construction materials and fire resistive ratings. OSHA regulations in regard to roofing. NFPA requirements.
- D. Limitations of Authority: Unless specific exceptions are established by written instructions issued by the Architect of Record or Owner:
  - 1. Do not authorize deviations from the Contract Documents. Do not enter into the area of responsibility of the General Contractor's superintendent.

**PART 2 - PRODUCTS**

(Not applicable)

**PART 3 - EXECUTION****3.01 PRE-ROOFING CONFERENCE**

- A. Organize and Conduct a pre-roofing conference prior to the installation of the roofing system.
- B. In attendance shall be General Contractor's superintendent, Home Depot's Project Manager, Architect of Record, roofing inspector assigned to the project, Roofing Contractor, roofing materials Manufacturer's Technical Representative and others as indicated by Home Depot or Architect of Record.
- C. Receive from the Contractor the following verifications:
  - 1. Copy of letter from primary roofing materials manufacturer stating that the Roofing Contractor is an approved applicator of the roof system. The letter shall also certify that all products and materials used in the roof system are compatible and acceptable to the manufacturer. A representative of the roofing manufacturer's company shall sign the letter.
- D. Review and define the following during the pre-roofing conference:
  - 1. The roofing installation schedule.
  - 2. The existing site conditions
  - 3. Staging and sequencing of the roofing work.
  - 4. How and where the materials are to be stored.
  - 5. Roofing specifications, drawings, and submittals.
  - 6. Contract terms not of financial nature.
  - 7. The roofing inspector's daily reports.
  - 8. The mechanical fastening of insulation boards.
  - 9. Perimeter, corner, and filed batten spacing (system dependent)
  - 10. Perimeter, corner, and field sheet layout and fastener spacing (system dependent).
  - 11. Seams and seaming techniques including placement of covers over T-joints.
  - 12. Inside/Outside corner base flashing details.
  - 13. Metal edge terminations.
  - 14. The unacceptability of phasing the roofing application.  
NOTE: Roof sections shall be completed in their entirety including penetration flashings prior to moving to another roof section.
  - 15. Roof penetration details.
  - 16. The existing substrate, roof slope, drainage, parapets, terminations, and nailers.
  - 17. The Contractor shall limit foot and wheel traffic on newly placed insulation and membrane to prevent crushing of insulation.
  - 18. Placement of protective walkpads.
  - 19. Roof drain installation procedures.



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**Construction Specification****ROOFING TESTING AND INSPECTION SERVICE**

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- E. Roof Walk-Over: conduct a roof-walk over and note the condition of the substrate noting the fastener / weld attachment method of the metal decking, the slope of the roof, any low spots, roof membrane termination areas and the staging of roofing material storage on the roof surface.
- F. Prepare a report of the pre-roofing meeting including all items discussed and distribute to the following:
  - 1. CONTRACTOR shall post the report in PDF format to EXPESITE in the appropriate folder "J10 – Construction Meeting Minutes" and notify the HOME DEPOT PROJECT MANAGER, ARCHITECT, FBO Roofing Vender, and Roofing Inspector (ITC).

**1.01 GENERAL DUTIES**

- A. Inspections:
  - 1. The testing service shall provide continuous inspections during single-ply roofing installation, by providing personnel to be on-site at the times Contractor indicates to the Testing Service and Owner that roofing work will be in progress.
  - 2. The testing service shall verify all phases of the work are in substantial compliance with the contract Documents. Report any defective work to contractor, Owner's representative, and the Project Manager.
  - 3. Notify the Contractor each day to keep the site clean of roofing debris.
  - 4. Forms for inspection are provided by the owner.
- B. The testing service management team shall assist the Contractor in understanding the intent of the Contract Documents.
- C. The testing service shall obtain from the Architect of Record additional details or information if, and when, required at the site for prior execution of the Work. The testing service shall become acquainted with standard of reference specifications.
- D. The testing service will review suggestions of recommendations with the Owner's Representative.
- E. The testing shall remain alert to changes in the construction schedule and to conditions that may cause delay in completion, and report these potential changes to Contractor and Owner's Representative.
- F. If any government agency or manufacturer's inspector visits the project to review the roofing construction, the testing service shall accompany such inspectors during their review, record the report to the contractor and Owner's Representative the results of these inspections.
- G. Should a dispute occur at any time, the testing service will immediately report to Contractor and Owner's Representative the nature of the dispute, the parties involved, and whether or not it was resolved.
- H. The testing service shall issue notices daily to the roofer of deficiencies in his work that require corrective measures. Note deviations on the daily report form and request immediate correction.
- I. If a situation arises during construction that, in the testing service inspector's view, requires the work to be rejected, report such situations immediately to the Contractor, Owner's Representative, and Project Manager.

**1.02 MATERIAL STORAGE AND HANDLING**

- A. When roofing materials arrive on the job site, check condition of materials and check labels for conformance with specifications and drawings.
- B. Keep a record of all materials as materials arrive.
- C. Keep one label from each type of roofing material and supplier's certificates.
- D. Verify that Contractor prohibits storage of roofing materials directly on the ground or substrate. Contractor shall ensure that roofing materials will be placed on raised platforms, and will not overload the substrate.
- E. Verify roofing materials are covered with waterproof coverings that have been properly secured. ("Breathable" coverings preferred.)
- F. Verify the Contractor does not allow prolonged site storage unless suitable weather-protected enclosures are used.
- G. Verify that uncured membranes are kept covered away from sunlight. When possible, require uncured membranes shall be brought to the roof surface on an as needed basis.

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**Construction Specification****ROOFING TESTING AND INSPECTION SERVICE**

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- H. Verify that lids are replaced on cans of materials stored on the job site.  
  
Notify Contractor when insulation boards with crushed or otherwise damaged edges or corners are observed. Such damaged boards shall not be installed by Contractor.
- I. Notify contractor when insulation boards with water damage are observed. Contractor shall not install such damaged boards. Check that lightweight insulation boards have been weighted down to prevent wind damage and covered to prevent moisture damage, by the Contractor.
- J. If material is moved over a completed roof section, verify that Contractor requires protective runways be placed on the completed roof sections.
- K. Observe all fire precautions involving the storage and handling of roofing material.

**1.03 WEATHER CONDITIONS**

- A. Check temperatures, moisture, and weather forecasts before Contractor's application of any roof components. Record all conditions in the daily report.
- B. Verify that roofing materials are not installed in moisture, snow, or are present on the roof. Verify that Contractor prohibits all work until the surface has been thoroughly dried, by natural or artificial means.
- C. If the forecast is for inclement weather, verify that Contractor stages work accordingly to avoid laying out more work than can be made watertight if the weather changes.
- D. Verify that roofing materials are not installed if precipitation of any kind is occurring.
- E. Verify that in cold temperatures, adhesives have properly "flashed off" and not "skinned over".

**1.04 STRUCTURAL DECK**

- A. Verify that Contractor has properly prepared the deck and that the deck is free of debris and dirt.
- B. Verify that Contractor does not permit stacking of materials beyond the design live-load on local deck areas. Check with Architect of Record if the design live-load is not known.
- C. Check curb details, mechanical curb locations, roof expansion joints, area dividers, and drains for substantial compliance with plans and specifications.
- D. For metal decks, verify that fasteners and lap screws are in place. Verify that all edges are supported.

**1.05 FASTENERS AND FASTENER PLACEMENT**

- A. Verify the fastener placement in the insulation.
- B. Verify the fastener placement in the batten bar / sheet edges, in the perimeter, corners and roof field.
- C. Verify the fastener/batten bar placement around all penetrations and at roof edges.
- D. Obtain the roofing supplier's approved fastening patterns and provide to Owner in the final project report. Verify that approved fastening pattern meets the FM requirements in Specification Roofing Section.

**1.06 SINGLE-PLY MEMBRANE**

- A. Verify that Contractor prohibits use of heavy mechanical equipment that may puncture the membrane, crush the insulation or deflect the deck excessively.
- B. Verify that the lap area is cleaned and / or primed by Contractor, in accordance with manufacturer's recommendations, prior to splice adhesive placement.
- C. Verify splice adhesive application methods approved by membrane manufacturer is utilized.
- D. Verify that splice adhesive has properly "flashed off" by using a dry finger to spot check adhesive to be certain adhesive does not stick or string.
- E. Verify that the closed lap is properly rolled in accordance with manufacturer's specifications, using the appropriate roller.

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**Construction Specification****ROOFING TESTING AND INSPECTION SERVICE**

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- F. Verify that edge nailers, curbs and penetrations are properly in placed prior to roofing so membranes may be laid as continuously as possible.
- G. Verify that cover strips are placed over all membrane T-joints.
- H. Verify that any irregularities, such as fishmouth and wrinkles through seams are repaired on a daily basis.
- I. Verify daily that all adhered laps are sealed with lap/seam sealant when out gassing of adhesives is complete and prior to inclement weather.
- J. Verify that Contractor prohibits phased construction of the membrane.
- K. Verify the roof is being applied in substantial accordance with the roofing specifications.

**1.07 FLASHINGS**

- A. Observe application methods during installation of flashings.
- B. At the end of each day's operation, all laps are to be sealed with lap/seam sealant, unless all seam gassing has not occurred. Prior to inclement weather, all laps be sealed with lap/seam sealant, whether seam gassing is complete or not. The top of all base flashings shall be sealed with the appropriate termination method, water block/water cut off sealant and caulking to prevent water from entering behind base flashings.
- C. Verify that penetration flashings are properly installed in accordance with the roofing specifications.

**1.08 DRAINAGE**

- A. Observe the drainage characteristics for compliance to the specifications.
- B. Carefully observe the application methods of the drains for proper installation.
- C. Check for proper shingling of membrane laps.

**1.09 REPORTS AND DEFECT/DEVIATION LISTS**

- A. Distribute reports and defect/deviation lists to the following:
  - 1. ITC shall post the report in PDF format to EXPESITE in the appropriate folder "J09 – Testing & Inspection Reports" and notify the HOME DEPOT PROJECT MANAGER, ARCHITECT, CONTRACTOR, and FBO Roofing Vendor.
- A. Defect/Deviation lists: The Roofing Testing and Inspection Service's inspector shall punch list the project on a daily basis and instruct the roofer to initiate repairs immediately. The inspector shall submit to those parties listed above, a final defect/deviation list of any items yet to be completed or corrected as of the last day he is on the project. Defect/Deviation numbers shall be keyed to the locations on a roof sketch.

**1.02 DAILY REPORTS**

- A. Daily reports shall include the following:
  - 1. Project name and address
  - 2. Date
  - 3. Roofing specification number and/or description
  - 4. Inspection firm
  - 5. Office Location
  - 6. Inspector's name
  - 7. Time inspector arrived and left
  - 8. General Contractor's name
  - 9. General Contractor's superintendent's name
  - 10. Roofing Contractor's name.
  - 11. Roofing Contractor's foreman's name.
  - 12. Crew Size
  - 13. Time crew started and left.
  - 14. Weather conditions
  - 15. Weather forecast for next day
  - 16. Ambient temperature range.
  - 17. Roofing manufacturer and material
  - 18. Substrate type and condition

**Construction Specification****ROOFING TESTING AND INSPECTION SERVICE**

19. Insulation manufacturer and material
20. Membrane manufacturer and material
21. Splice adhesive name, number and manufacturer's name
22. Bonding adhesive name, number, and manufacturer's name
23. Adhesive application method
24. Type of interior drain (if used)
25. Record conformance or deviation from the specifications. Induce resolution of all deviations items.
26. A description of the work performed that day.
27. A sketch of the roof showing the area where work was performed that day. Include locations of any deficiencies/defects found and key locations to the defect/deviation list.
28. Indication if test samples were required, if they were taken and their location.
29. Number of squares completed that day.
30. Indication if edges and flashing were sealed that day.
31. Indication if debris was cleaned that day.
32. Indication if the materials were covered and secured.
33. Indication if the penetrations were sealed.
34. Inspector's signature.

**1.03 FINAL PROJECT REPORT**

- A. After the roofing work is complete and defect/deviation list items corrected a final project report shall be compiled, bound and sent to the parties listed above. The report shall include the following
  1. A letter from the Testing Service stating that the roofing system was installed in general accordance with the plans specifications and manufacturer's recommendations, and all previously noted final defect/deviation list items are corrected.
  2. Approved method for insulation, batten bar, and/or sheet edge fastener fastening pattern.
  3. A copy of the final defect/deviation list and inspection report.
  4. A copy of the pre-construction conference report.
  5. A sketch of the roof showing each day's work area, crickets, and construction joints.
  6. Copies of all daily reports.
  7. One label from each type of roofing material delivered to the job site.
  8. Photographs of:
    - a. Crickets
    - b. The installation of roof drain flashings
    - c. The installation of the insulation (first and second layers).
    - d. The insulation fastener pattern.
    - e. The batten bar/sheet edge fastener pattern in the perimeter, corners and roof field.
    - f. Any problem areas

**1.04 CLOSE OUT REQUIREMENT**

- A. The Testing Service shall submit three bound copies of the complete roofing inspection reports, final punch observation and back check report to the Architect of Record upon completion of the project.
- B. The Testing Service shall submit to the Architect of Record a report stating when the Contractor began the roofing application, completed the roofing application, and the total number of days the roofing contractor was on the project. This report shall include all inclement weather days and day's inspection reported to job site and no work was accomplished.

END OF SECTION

**PART 1 - GENERAL****1.01 RELATED DOCUMENTS****A. Related work specified elsewhere:**

1. Project Closeout.

**1.02 QUALITY ASSURANCE**

- A. Reference Standards: Comply with current standards of the American Congress of Surveying and Mapping (ACSM), the American Land Title Association (ALTA), and the current edition of applicable provisions of published codes and standards unless noted otherwise.
- B. Owner's Approval: Refer to Bid Proposal Form for Owner's approval of Survey & Layout company and project crew.

**1.03 CONTRACTOR FURNISHED SURVEY INFORMATION**

- A. The Contractor shall verify all survey information and notify the Architect of Record in writing of any discrepancies or conditions detrimental to the completion of the work. Do not proceed with the work until such conditions have been corrected.
- B. The Contractor shall provide all surveying and layout during the construction phase, including but not limited to earthwork, the building and/or expansion, on-site and off-site construction as applicable.
- C. The Contractor shall provide a legal description of all final on-site and off-site utility easements. Contractor shall coordinate with applicable utilities and authorities having jurisdiction regarding specific requirements for easements. Final Record legal description of all easements shall be submitted to the Architect of Record for distribution to the Owner and the Owner's legal counsel as a part of the Record Documents for the project.

**PART 2 - PRODUCTS**

Not Applicable

**PART 3 - EXECUTION**

Not Applicable

**END OF SECTION**

**Construction Specification****TEMPORARY CONSTRUCTION FACILITIES****PART 1 - GENERAL****1.01 DESCRIPTION OF REQUIREMENTS**

- A. General: This section of the General Requirements specifies minimum requirements for temporary facilities, to ensure the possibility of construction processes including fabrication and installation of work at project site. The providing of temporary facilities is the Contractor's sole responsibility and is not limited to minimum established by requirements thereof. Temporary construction facilities are defined to exclude tools and self-contained construction machines and equipment.
- B. The types of temporary construction facilities for the project include but are not necessarily limited to the following:
  - 1. Construction Water Distribution
  - 1. Dewatering Facilities and Drains
  - 2. Temporary Enclosure
  - 3. Temporary Sanitary Facilities
  - 4. Temporary Heat
  - 5. Hiring Trailer (Alternate)
  - 6. Temporary Power Distribution
  - 7. Temporary Lighting
  - 8. Temporary Traffic Control
  - 9. Trash Removal
  - 10. Temporary Signs
- C. Related work specified elsewhere includes but may not be limited to:
  - 1. Section 02200: Earthwork

**1.02 QUALITY CRITERIA**

- A. Standards: Comply with NFPA Code 241 "Building Construction and Demolition Operations" and with ANSI - Series standards "Safety Requirements for Construction and Demolition".

**1.03 JOB CONDITIONS**

- A. Scheduled Uses: Provide temporary construction facilities ready for use at each location, at time first needed to avoid delays in performance of the work. Maintain, expand and modify as needed through progress of work and do not remove until no longer needed or replaced by authorized use of completed permanent facilities of project.
- B. Temporary Use of Permanent Facilities: Regardless of previously assigned responsibilities for temporary facilities, the Installer of each permanent facility shall assume responsibility for its operations, maintenance and protection during use as a construction facility prior to final inspection and assumed operation of the facility.
- C. Conditions of Use: Operate, maintain, control and protect temporary construction facilities to prevent overloading, freezing, pollution, contamination of water source, flooding, unsanitary conditions, hazardous exposures, fire, disease, erosion of site, damage or deterioration of completed work, public nuisances, and deleterious effects.

**PART 2 - PRODUCTS (Non-Applicable)****PART 3 - EXECUTION****3.01 INSTALLATION OF TEMPORARY FACILITIES**

- A. General: Use qualified tradesmen for installation of temporary construction facilities. Locate facilities where they will serve the total project construction work, and result in minimum interference with performance of the work. Relocate, modify and extend facilities during course of the work, to accommodate entire work of project.
  - 1. Change-over from use of temporary facilities at the earliest feasible date in each portion of building, so as to minimize hazards and interferences with performance of the work commonly associated with temporary facilities. Do not use permanent water piping for distribution of non-potable water.

**3.02 OPERATIONS AND TERMINATION**

- A. Supervision: Limit availability of facilities to essential uses, so as to minimize waste and abuse.
- B. Maintained Operations: Maintain operation of temporary enclosures, heating and ventilation on a twenty-four (24) hour per day basis to avoid possibility of damage to the work and temporary facilities. Prevent water filled piping and vessels from freezing, whether temporary or permanent, by either draining or by insulation or heating.
- C. Termination and Removal: When need has ended for each temporary construction facility or for a substantial element of facility, or when it has been replaced by authorized use of a permanent facility, or no later than time of completion, remove temporary facility. Complete work that may have been delayed because of interferences with temporary facilities and restore

**Construction Specification****TEMPORARY CONSTRUCTION FACILITIES**

work.

**3.03 CONSTRUCTION WATER DISTRIBUTION**

- A. Install water service and distribution piping in sizes and pressures adequate for construction.

**3.04 DEWATERING FACILITIES AND DRAINS**

- A. General: Provide temporary drainage and dewatering facilities and operations (not directly associated with performance of individual work items specified in Division 2 through 16). Maintain site, excavation and construction free of water.

**3.05 TEMPORARY ENCLOSURE**

- A. Provide temporary enclosure where temporary heat is needed and permanent building enclosure is neither yet completed nor adequate for containment of temporary heat. Coordinate temporary enclosures with ventilating and drying-of-the-work requirements.

1. Where temporary wood/plywood enclosure exceeds 100 square feet in area, use fire-retardant treated wood/plywood (UL labeled "A") Type A? for main sheathing, and use a minimum of non-treated wood framing and trim.

**3.06 TEMPORARY SANITARY FACILITIES**

- A. Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

**3.07 TEMPORARY HEAT**

- A. General: Provide temporary heat for curing or drying of work installed, or for protection of work in place, from adverse affects of low temperatures or high relative humidity.
- B. Heating Facilities: Install the following heating system for general use, except where permanent heating system of project is available and authorized for use:

1. Steam or hot water heating-coil units, with or without power blower; with piping distribution and return system; with individual space thermostatic control.
2. Self-contained LP gas for fuel oil heaters, vented; with individual space thermostatic control.
3. Limitations: In any case, do not use open burning or salamander type temporary heating units when combustible materials are located in or near the space being heated, or when the work installed or being installed includes work which will be exposed to view in completed project. Limit use of gasoline-burning space heaters to indirect - fired type, located outside the building or space being heated, and use only where systems listed in 3.04 B1 & 2 cannot be used.

**3.08 HIRING TRAILER (ALTERNATE)**

- A. Hiring trailer shall be provided, as outlined below, where required by the Home Depot Project Manager. The General Contractor shall provide a bid for this trailer as an alternate on the Bid Proposal Form.
- B. General: The General Contractor shall lease and provide on-site a 12' x 40' or 10' x 40' trailer for Home Depot's use. The trailer shall have full power, five (5) phone lines, air-conditioning and heat. The trailer shall have an office on each end of the trailer and a general seating area located in the center.
- C. Hiring trailer temporary power and data lines, trenching and conduits shall be installed prior to paving operations. The temporary power can share utility trench and conduit from main site light home run. Separate conduit for data line to trailer should be included in base bid, but data line conduit can share site light home run utility trench.
- D. The trailer shall be on-site four (4) weeks prior to turnover and remain until the day before Grand Opening. All costs for the trailer, power and phone lines shall be included in General Contractor's contract. Home Depot shall reimburse the Contractor for any long distance and local phone service costs.
  1. The General Contractor shall coordinate with the Home Depot Project Manager for a location on-site to locate the hiring trailer.
  2. Contractor shall provide next to the hiring trailer a portable restroom for use by the store personnel. The contractor shall keep this restroom clean at all times to the satisfaction of the Project Manager.
  3. Contractor shall provide that the hiring trailer is handicap accessible and that furnishings within accommodate handicapped applicants per Americans with Disabilities Act (ADA) requirements.

**3.09 TEMPORARY POWER DISTRIBUTION**

- A. General: Provide a weatherproof, grounded, temporary power distribution system to accommodate performance of entire work of project, including but not necessarily limited to use of tools, equipment and electrical construction machines, operation of test equipment and test operation of building equipment and systems which cannot be delayed until permanent power connections are operable, temporary operation of other temporary facilities including permanent equipment and systems which must be

**Construction Specification****TEMPORARY CONSTRUCTION FACILITIES**

placed in operation prior to use of permanent power connections (pumps, HVAC equipment, elevators, and similar equipment). Run circuit wiring overhead and rise vertically in locations where it will be least exposed to possible damage from construction operations and result in least interference with performance of the work. Provide rigid steel conduit for wiring that must be exposed on grade, floors, decks or other recognized exposures to damage or abuse. Provide overload-protected disconnect switch for temporary power distribution center.

**3.10 TEMPORARY LIGHTING**

- A. General: Provide a weatherproof, grounded temporary lighting system in every area of construction work as soon as overhead floor/roof deck structure has been installed. Provide illumination for safe work and traffic conditions. Temporary lighting level shall maintain a minimum of 5 FC in work areas. Designated first aid areas shall maintain a minimum level of 30 FC. Run circuit wiring overhead and rise vertically in locations where it will be least exposed to damage from construction operations. Do not expose on grade, floors or decks. Provide overload-protected disconnect switch for each temporary power circuit located at power distribution center.

**3.11 TEMPORARY TRAFFIC CONTROL**

- A. Temporary Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate for construction operations. Locate temporary roads and paved areas within construction limits indicated on Drawings.
  - 1. Provide dust-control treatment that is non-polluting and non-tracking. Reapply treatment as required to minimize dust.
- B. Temporary Use of Permanent Roads and Paved Areas: Locate temporary roads and paved areas in same location as permanent roads and paved areas. Construct and maintain temporary roads and paved areas adequate for construction operations. Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations.
  - 1. Coordinate elevations of temporary roads and paved areas with permanent roads and paved areas.
  - 2. Prepare subgrade and install subbase and base for temporary roads and paved areas according to Section 02200 "Earthwork."
  - 3. Recondition base after temporary use, including removing contaminated material, regrading, proofrolling, compacting, and testing.
  - 4. Recondition base after temporary use, including removing contaminated material, regrading, proofrolling, compacting, and testing.
- C. Traffic Controls: Comply with requirements of authorities having jurisdiction.
  - 1. Protect existing site improvements to remain including curbs, pavement, and utilities.
  - 2. Maintain access for fire-fighting equipment and access to fire hydrants.
- D. Parking: Provide temporary parking areas for construction personnel.

**3.12 TRASH REMOVAL**

- A. Contractor shall provide a (40) yard dumpster for the Home Depot use from turnover date until Grand Opening. Dumpsters are required to be emptied once a week, or when full, at Contractor's cost.
- B. California Projects Only: Contractor to provide Dumpsters to meet 2010 California Green Building Code Tier requirements.

**3.13 TEMPORARY SIGNS**

- A. Contractor shall provide temporary signage as follows:
- B. Contractor Kit - installed 6 months prior to Grand Opening:
  - 1. Kit to include:
    - a. (1) Coming soon sign - to be placed on construction site.
    - b. (1) Driveway sign - to be placed at entrance to site to redirect potential applicants
    - c. (2) On-site signs - to be placed at strategic on-site positions (construction trailer, next to road, etc.) to redirect potential applicants and discourage public access to construction site
  - 2. Each sign in contractor kit is to be mounted in white omega board sized to match sign. Each signboard is to be mounted to (2) 4x4 pressure treated posts at the sides of the signboard. Posts are to be embedded in ground 36" minimum. The bottom of the sign is to be at 48" above ground.
- C. New Store Kit - installed 4 weeks prior to Turnover.
  - 1. Kit to include:
    - a. Grand Opening Hiring Banner - coordinate location with Home Depot Project Manager
- D. Sign packages to be ordered through:



**Construction Specification**

**TEMPORARY CONSTRUCTION FACILITIES**

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ID Associates  
1771 Industrial Road, Dothan, AL 36303  
Contact: Ron Boutwell - Purchasing Manager  
Phone: (334) 836-1400  
[purchasing@idassociatesinc.com](mailto:purchasing@idassociatesinc.com)

Note: Allow 1-2 weeks for delivery

END OF SECTION

**Construction Specification****SUBSTITUTIONS AND PRODUCTS OPTION****PART 1 - GENERAL****1.01 REQUIREMENTS INCLUDED**

- A. Included in this section are requirements, criteria, options and conditions for product substitutions by the Contractor.

**1.02 RELATED REQUIREMENTS**

- A. Substitutions during the bidding period: Instructions to Bidders.

**1.03 PRODUCTS LIST**

- A. Upon award of Bid, Contractor shall submit to Architect of Record five (5) copies of complete list of major products proposed for installation.
- B. Contractor shall tabulate products by specification section number and title.
- C. For products specified only by reference standards, Contractor shall list for each such products:
  - 1. Names and Address of Manufacturer
  - 2. Trade Name
  - 3. Models and Catalog Designation
  - 4. Manufacturer's Data
    - a. Reference Standards
    - b. Performance Test Data

**1.04 CONTRACTOR OPTIONS**

- A. For products specified only by reference standard, Contractor shall:
  - 1. Select product meeting that standard, by any manufacturer.
- B. For products specified by naming several products or manufacturers, Contractor shall:
  - 1. Select any one of products and manufacturers names that complies with specifications.
- C. For products specified by naming one or more products or manufacturers and stating "or equal", Contractor shall:
  - 1. Select any one of products and manufacturers' names that complies with specifications.
  - 2. Submit a request as for substitutions, for any product or manufacturer that is not specifically named.
- D. For products specified by naming only one product and manufacturer, Contractor shall:
  - 1. Have no options and no substitutions will be allowed.

**1.05 SUBSTITUTIONS**

- A. At the time of Bid, substitutions will be considered.
  - 1. After bid, requests will be considered only in case of product unavailability or other conditions beyond control of Contractor.
- B. Contractor shall submit separate request for each substitution and support each request with all of the following:
  - 1. Complete data substantiating compliance with requirements stated in Contract Documents:
    - a. Product identification, including manufacturer's name and address.
    - b. Manufacturer's literature; identify:
      - 1) Product Description
      - 2) Reference Standards
      - 3) Performance and Test Data
    - c. Samples as applicable.
    - d. Name and address of similar projects on which product has been used and date of each installation.
  - 2. Itemized comparison of the proposed substitution with product specified; list significant variations.
  - 3. Date relating to changes in construction schedule resulting from proposed substitution or denial of substitution.
  - 4. List of all effects of substitutions on separate contracts.

**Construction Specification****SUBSTITUTIONS AND PRODUCTS OPTION**

5. List of all changes required in other work or products resulting from proposed substitution.
6. Accurate cost data comparing proposed substitution with product specified.
  - a. Amount of any net change to Contract Sum.
7. Designation of all required license fees or royalties.
8. Designation of availability of maintenance services, or sources of replacement materials.
- C. Architect of Record or Owner will not consider substitutions for acceptance when:
  1. They are indicated or implied on shop drawings or product data submittals without a formal request from Contractor.
  2. They are requested directly by subcontractor or supplier.
  3. Acceptance of substitution will require substantial revisions of Contract Documents.
- D. Contractor shall not order or install substitute products without written acceptance of Architect of Record and Owner.
- E. Architect of Record and Owner will determine acceptability of proposed substitutions.
- F. Regardless of whether or not the Architect of Record approves the proposed substitution, the Architect of Record shall be reimbursed at the published manhour rate plus any direct cost for all time spent by the Architect of Record and/or his consultants in evaluating each proposed substitution. A Change Order will be issued to reduce the Construction Contract by an amount equal to the fees charged by the Architect of Record for reviewing one or more proposed substitutions, the Owner in accordance with the Change Order amounts will reimburse The Architect of Record.

**1.06 CONTRACTOR REPRESENTATIONS**

- A. Making formal request for substitution represents that Contractor:
  1. Has investigated proposed product and had determined that it is equal to or superior in all respects to that specified.
  2. Will produce same warranties or bonds for substituted products as for product specified.
  3. Will coordinate installation of accepted substitution into the work and will make such changes as may be required for the work to be complete in all respects.
  4. Waives claims for additional costs caused by substitution that may subsequently become apparent.
  5. Has complete cost data which includes Architect of Record's cost to redesign or revise Contract documents and other related costs under contract, but not:
    - a. Costs under separate contracts.

**1.07 ARCHITECT OF RECORD'S DUTIES**

- A. Architect of Record will review Contractor requests for substitutions with reasonable promptness.
- B. Architect of Record will notify Contractor, in writing, of decision to accept or reject requested substitution.
- C. Architect of Record's review of substitution and/or product options will be limited to one (1) review per submittal.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

**PART 1 - GENERAL****1.01 SUMMARY**

- A. This Section covers Project Closeout Procedures including, but not limited to:
1. Closeout Documents
    - a. Warranty / Maintenance Manual
      - i. Letter of Conformance
      - ii. Product Data
      - iii. Warranty Letter
    - b. As Builts
  2. Testing
  3. Final Cleaning
  4. Punch Walks
  5. Turnover and Closeout Log
  6. Warranty and Warranty Walks
- B. The types of operations and maintenance data requirements specified in this section include submittals, and equipment check out and demonstration, and related items. Individual requirements for specific equipment and systems are specified in the applicable sections for each unit of work. Refer to other Division 1 sections and other Contract Documents for requirements of administrative submittals.

**1.02 DESCRIPTION**

- A. Definitions:
1. Closeout is hereby defined to include general requirements near end of Contract Time, in preparation for final acceptance, final payment, normal termination of contract, occupancy by owner and similar actions evidencing completion of the work. Specific requirements for individual units of work are specified in sections of Division 2 through 16.
  2. Time of closeout is directly related to "substantial completion".

**1.03 CLOSEOUT DOCUMENTS**

- A. Warranty / Maintenance Manual: Contractor, prior to Substantial Completion, shall utilize the attached Warranty / Maintenance Manual Checklist to provide a complete list of Subcontractor's & Material suppliers and the following close out documentation. The list shall be in order as listed in the Warranty / Maintenance Manual Checklist and shall contain company name, address, phone number, and contact name. Contractor shall post one copy of the list to Exesite under the appropriate folder "L05 – MAINTENANCE MANUAL" in PDF format.
1. Certificate of Letter of Conformances:
    - a. Contractor shall utilize and complete in full the attached Certificate of Letter of Conformances for all divisions of work as identified to be required.
    - b. Contractor shall post one copy of all final Letter of Conformances to Exesite under the appropriate folder "L05 – MAINTENANCE MANUAL" in PDF format. The Contractor shall task the Architect of Record and notify the Home Depot Project Manager upon ALL Letters of Conformance being uploaded to Exesite. Contractor shall post in PDF format with the following naming convention: "Home Depot Store Number\_City, State\_CSI division\_Letter of Conformance" (example: "0000\_Anywhere, GA\_Division 7 Roofing\_Letter of Conformance").
    - c. Upon review, should Architect of Record indicate the required contents posted to Exesite, both in content and naming convention is incomplete, Architect of Record will reassign said task back to the Contractor with a list of deficiencies with notification to the Home Depot Project Manager. Contractor shall repost updated content and reassign task back to Architect of Record for final approval. Upon final approval, Architect of Record will indicate task is complete and notify Contractor and Home Depot Project Manager.
  2. Product Data:
    - a. Contents shall be prepared by the manufacturer and show name, address, and phone number of the nearest service facility authorized by the manufacturer and shall include illustrations, diagrams, and instructions for installation, start-up operation, inspection, maintenance, parts lists, and data sheets.
    - b. Complete electrical schematic and connection diagrams shall be provided for each equipment item.
    - c. Contents shall also include the name, address, and phone number of the Contractor and/or Subcontractor who furnished and/or installed equipment and systems. Contents shall also include the name(s) and phone numbers of representatives of the Contractor to be contacted in the event of Emergency Situation, as defined in the General Conditions.
    - d. In those instances where the equipment or its mode of control, or both, is job assembled by a Subcontractor for special functions, then that Subcontractor shall prepare and provide written operating and maintenance instructions.
    - e. Contractor shall post one copy of all final said manuals, instruction books, diagrams, etc., to Exesite under the appropriate folder "L05 – MAINTENANCE MANUAL" in PDF format. The Contractor shall task the Architect of Record and notify the Home Depot Project Manager upon ALL documents being uploaded to Exesite. Contractor shall post in PDF format with the following naming convention: "Home Depot Store Number\_City, State\_CSI section reference – Subject Name" (example: "0000\_Anywhere, GA\_02721 – Store Drainage System").
    - f. In each PDF document the correct model number and data for the model number shall be highlighted where the literature covers more than one model.

- g. Upon review, should Architect of Record indicate the required contents posted to Exesite, both in content and naming convention is incomplete, Architect of Record will reassign said task back to the Contractor with a list of deficiencies with notification to the Home Depot Project Manager. Contractor shall repost updated content and reassign task back to Architect of Record for final approval. Upon final approval, Architect of Record will indicate task is complete and notify Contractor and Home Depot Project Manager.
  - 3. Warranty Letter:
    - a. Contents of the Warranty portion shall contain the following information for each Warranty included:
      - i. CSI section reference from project specifications.
      - ii. Product name and specific model number.
      - iii. Manufacturer's name, address and phone number.
      - iv. Contractor's and/or Subcontractor's name who furnished and/or installed equipment, address and phone number.
      - v. Emergency Contact: name and phone numbers of representatives of the in the event of Emergency Situations as defined in the General Conditions.
      - vi. Duration of each Warranty.
      - vii. Start of Warranty Period shall commence upon Grand Opening or Owner's acceptance.
    - b. Contractor shall post one copy of all final warranty letters to Exesite under the appropriate folder "L04 – WARRANTY" in PDF format. The Contractor shall task the Architect of Record and notify the Home Depot Project Manager upon ALL warranty letters being uploaded to Exesite. Contractor shall post in PDF format with the following naming convention: "Home Depot Store Number\_City, State\_CSI section reference – Subject Name" (example: "0000\_Anywhere, GA\_07240 – Exterior Insulation and Finish System").
    - c. Upon review, should Architect of Record indicate the required contents posted to Exesite, both in content and naming convention is incomplete, Architect of Record will reassign said task back to the Contractor with a list of deficiencies with notification to the Home Depot Project Manager. Contractor shall repost updated content and reassign task back to Architect of Record for final approval. Upon final approval, Architect of Record will indicate task is complete and notify Contractor and Home Depot Project Manager.
- B. As Builts: As Builts shall be prepared in accordance with provisions of the General Conditions.
  - 1. Contractor shall post one final copy of As-Builts to Exesite under the appropriate folder, "L01 – AS-BUILT DOCUMENTS" in a PDF format. The Contractor shall task the Architect of Record and notify the Home Depot Project Manager upon As-Built documents being uploaded to Exesite. Contractor shall post in PDF format with the following naming convention: "Home Depot Store Number\_City, State\_As-Builts" (example: "0000\_Anywhere, GA\_As-Builts").
  - 2. Upon review, should Architect of Record indicate the required contents posted to Exesite, both in content and naming convention is incomplete, Architect of Record will reassign said task back to the Contractor with a list of deficiencies with notification to the Home Depot Project Manager. Contractor shall repost updated content and reassign task back to Architect of Record for final approval. Upon final approval, Architect of Record will indicate task is complete and notify Contractor and Home Depot Project Manager. Upon completion of task, Contractor shall place one (1) full size printed copy in a PVC tube in the Electrical Room.

#### 1.04 TEST

- A. Equipment companies and/or installing vendors shall check out and demonstrate their equipment including field tests which shall be witnessed by representatives of the Owner, and the designated employees of Owner and shall be performed prior to final completion as soon as reasonably possible after Substantial Completion. Equipment startup, testing and commissioning reports shall be provided to Owner by Equipment Company installing vendors.
  - 1. Contractor shall post one final copy of the reports to Exesite under the appropriate folder "L05 – Maintenance Manual" in a PDF format. The Contractor shall task the Architect of Record and notify The Home Depot Project Manager upon reports being uploaded to Exesite. Contractor shall post in PDF format with the following naming convention: "Home Depot Store Number\_City, State\_Specific Report" (example: "0000\_Anywhere, GA\_Air Balance Report").
- B. This includes, but shall not be limited to, all equipment specified, under Divisions and equipment so indicated on the Drawings and listed below:
  - 1. Dock Levelers
  - 2. Compactor
  - 3. Bailer
  - 4. Pneumatic Tube System
  - 5. HVAC Equipment
  - 6. Fire Protection Equipment
  - 7. Energy Management System
  - 8. Generator and Automatic Transfer Switch
  - 9. Security System
  - 10. Communication System
  - 11. CCTV

#### 1.05 FINAL CLEANING

- A. General: General cleaning during progress work is specified in General Conditions. Provide final cleaning of the work, consisting of cleaning each surface or unit or work. Comply with manufacturer's instructions for cleaning operations. The following are examples, but by no way of limitation, of cleaning levels:

**Construction Specification****PROJECT CLOSEOUT**

1. Remove labels which are not permanent labels.
2. Clean transparent materials, mirrors and window/door glass, to a polished condition, removing substances that are noticeable as vision obscuring materials. Replace broken glass.
3. Clean exposed exterior and interior hard-surface finishes, including metals, masonry, stone, concrete, painted surfaces, plastics, tile wood and special coatings, to a dirt-free condition, free of rust, stains, films and substances. Except as otherwise indicated on the drawings, avoid disturbances of natural weathering of exterior surfaces. Restore reflective surfaces to original reflective condition.
4. Wipe surfaces of mechanical and electrical equipment clean, and remove excess lubrication and substances.
5. Remove debris and surface dust from limited-access spaces including plenums, shafts, equipment vaults and manholes.
6. Clean concrete floors in non-occupied spaces broom clean.
7. Clean plumbing fixtures to a sanitary condition, free of stains including those resulting from water exposure.
8. Clean light fixtures and lamps as to function with full efficiency.
9. Clean the concrete floors with a mechanical scrubber per the following and as identified in specification section 03360:
  - a. Prior to sealing concrete floor
  - b. Prior to fixturing
  - c. Prior to Grand Opening

**1.06 SUBSTANTIAL COMPLETION / PUNCH LISTS**

- A. Refer to General Conditions, Substantial Completion and Exhibit F, Benchmark Schedule, of specification section 00500, Stipulated Sum Contract.
- B. All punch lists shall be posted to the "J04-Punchlist" folder on Exesite as indicated below. The naming of these files shall be in the following format:  
"Home Depot Store Number\_City, State\_ YYYY-MM-DD\_Prepared By\_Phase-Punch List" (example: "0000\_Anywhere, GA\_2008-12-01\_Contractor\_Initial Punch List")
- C. Architect of Record shall prepare a punch list template and post it to the "J04-Punchlist" folder on Exesite on or prior to three (3) weeks before Turnover.
- D. Contractor shall prepare a preliminary contractor's punch list using the template identified in item C this section and post it to the "J04-Punchlist" folder on Exesite, one (1) week prior to Turnover. Contractor shall notify Owner and Architect upon posting. Contractor shall accurately report the condition of work at the time of preparing the punch list.
- E. The Home Depot Project Manager will schedule an initial punch walk at Turnover including Architect, MEP Engineer, Civil Engineer, Energy Management System Controls Contractor (EMSCC) & Fire Suppression Consultant and will prepare a punch list of items to be completed or corrected by the Contractor.
  1. Architect, MEP Engineer, Civil Engineer, Energy Management System Controls Contractor (EMSCC) & Fire Suppression Consultant will immediately notify Contractor of deficient items and leave copy of punch list at the jobsite for the Contractor after the punch walk.
  2. Architect, MEP Engineer, Civil Engineer, Energy Management System Controls Contractor (EMSCC) & Fire Suppression Consultant shall post the completed initial punch list to Exesite in the "J04-Punchlist" folder within one (1) week after punch walk / Turnover.
  3. Contractor shall complete work prior to Grand Opening and comply with provisions of General Conditions. In no way shall the items identified in the punch list form affect others work or Grand Opening date.
- F. Energy Management System Controls Contractor (EMSCC) will schedule a final punch walk at one and one half (1 ½) weeks prior to Grand Opening and will prepare a punch list of items to be completed or corrected per the requirements of Section 15960.
  1. EMSCC will immediately notify Contractor of deficient items and leave copy of punch list at the jobsite for the Contractor after the punch walk.
  2. EMSCC shall post the completed final punch list to Exesite in the "J04-Punchlist" folder within one (1) week after punch walk.
  3. Contractor shall complete work prior to Grand Opening and comply with provisions of General Conditions.
- G. The Home Depot Project Manager will schedule a final punch walk to coincide with the 2 week Building Services/Warranty punch walk after the Grand Opening.
  1. Architect, MEP Engineer, Civil Engineer, & Fire Suppression Consultant shall verify that all items listed on previous punch lists have been completed.
  2. Architect, MEP Engineer, Civil Engineer, & Fire Suppression Consultant will immediately notify Contractor of deficient items and leave copy of punch list at the jobsite for the Contractor after the punch walk.
  3. Architect, MEP Engineer, Civil Engineer, & Fire Suppression Consultant shall post the completed initial punch list to Exesite within one (1) week after punch walk.
  4. Contractor shall immediately complete work and comply with provisions of General Conditions.

**1.07 TURNOVER AND CLOSEOUT REQUIREMENTS**

- A. Contractor shall utilize and complete in full the attached Turnover and Closeout Log with the owner to verify that all items were

executed to completion.

1. Contractor shall post one copy of the list to Exesite under the appropriate folder "L09 – Close-out Checklist" in PDF format.

#### 1.08 WARRANTY

- A. Provide warranty in accordance with the General Conditions.
- B. Warranty Service requests:
  1. For all FBO warranty service requests, during the period of the warranty, will be called directly to the FBO supplier by Home Depot Building Services.
  2. For all Non - FBO warranty service requests, during the period of the warranty, will be called directly to the Contractor from Home Depot Building Services. The Contractor shall in turn contact the appropriate Subcontractor. Home Depot requires a 24-hour response from initial contact with the Contractor on all service requests. If repairs have not been completed per the requirements listed below, Home Depot may contact a local service Contractor for the required service. If local service Contractor is required to complete this work, the cost of the service will be invoiced to the Contractor deducted from the money owed to the Contractor from this project or another. Corrective action initiated by Home Depot shall not void the warranty. The Contractor will contact Home Depot and Building Services upon completion of warranty work.
    - a. For all life and/or safety items, service shall be complete within 24 hours of the request.
    - b. For all operations items, service shall be complete within three days of the request.
    - c. For all C priority items, service shall be complete within ten days of the request.
- C. Should the failure be such as to fall under the warranty, the cost of the service shall be borne by the Contractor. Otherwise, the Owner will pay, therefore, at the prevailing rate for such services. Home Depot will not be responsible for travel charges.
- D. Home Depot Building Services shall be performing two warranty walk inspections to verify that items were installed per specifications. These inspections will be scheduled:
  1. Grand Opening 2-weeks - Use the Grand Opening 2-Week Warranty Walk attached  
11 months after Grand Opening - Use the 11-Month Warranty Walk attached
    - a. Home Depot Building Services shall post one final document of Warranty Walk to Exesite under the appropriate folder, "L12 – 2 WEEK WALK and L13 – 11 MONTH WALK" in a PDF format. Home Depot Building Services shall task Contractor upon Warranty Walk documents being uploaded to Exesite. Home Depot Building Services shall post in PDF format with the following naming convention: "Home Depot Store Number\_City, State\_Grand Opening 2 Week Warranty Walk and/or 11 Month Warranty Walk (example: "0000\_Anywhere, GA\_ Grand Opening 2 Week Warranty Walk").
    - b. Upon completion of items outlined in Warranty Walks, Contractor to reassign task back to Home Depot Building Services for review. Upon review approval, Home Depot Building Services to reassign task to Home Depot Project Manager for final approval. Upon final approval, Home Depot Project Manager will indicate task is complete and notify Contractor and Home Depot Building Services.

- Attachments to Follow—

## WARRANTY / MAINTENANCE MANUAL CHECKLIST

The following is a minimum list of required Maintenance and Warranty/Product Data required. For additional information see specific specification sections.

(SPECIFICATION SECTION) <input type="checkbox"/> Item	N/A	Letter of Conformance	Product Data	Warranty Letter
<b>Division 1: GENERAL</b>				
<input type="checkbox"/> Gen Contractors Overall Warranty				<input type="checkbox"/> 1yr (from GO)
<input type="checkbox"/> Sub and Material Supplier List			<input type="checkbox"/>	
<b>Division 2: SITE WORK &amp; LANDSCAPING</b>				
<input type="checkbox"/> Termite Letter	<input type="checkbox"/>			<input type="checkbox"/> 5yr app
<input type="checkbox"/> Site Utilities-Fire Department Inlet Connections			<input type="checkbox"/>	
<input type="checkbox"/> Site Utilities-Fire Hydrants			<input type="checkbox"/>	
<input type="checkbox"/> Asphalt, Concrete Paving	<input type="checkbox"/>			<input type="checkbox"/>
<input type="checkbox"/> Pavement Markings	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/> 1yr (from GO)
<input type="checkbox"/> Storm Drainage System	<input type="checkbox"/>		<input type="checkbox"/>	
<input type="checkbox"/> Irrigation System Information	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/> 1 yr Irrigation
<input type="checkbox"/> Landscape Information – Trees and Shrubs	<input type="checkbox"/>			<input type="checkbox"/> 1yr (from GO)
<input type="checkbox"/> Landscape Information - Plants	<input type="checkbox"/>			<input type="checkbox"/> 90 day plants
<b>Division 3: CONCRETE</b>				
<input type="checkbox"/> Cast-in-place, Slab, Precast, Tilt-up Material	<input type="checkbox"/>			<input type="checkbox"/>
<input type="checkbox"/> Cast-in-place, Slab, Precast, Tilt-up Labor	<input type="checkbox"/>			<input type="checkbox"/>
<b>Division 4: MASONRY (If applicable)</b>				
<input type="checkbox"/> Certificate of ASTM compliance from reinforcing manufacturer	<input type="checkbox"/>			<input type="checkbox"/>
<input type="checkbox"/> Block Type Color and Supplier Information	<input type="checkbox"/>		<input type="checkbox"/>	
<input type="checkbox"/> Insulation Data	<input type="checkbox"/>	<input type="checkbox"/>		
<b>Division 5: STEEL &amp; METALS</b>				
<input type="checkbox"/> General Install	<input type="checkbox"/>			<input type="checkbox"/>
<input type="checkbox"/> Welded Deck Certification		<input type="checkbox"/>		
<input type="checkbox"/> Joist Schedule		<input type="checkbox"/>		
<input type="checkbox"/> Joist Girder & Column Schedules (see As-Built Drawings)		<input type="checkbox"/>		
<b>Division 6: CARPENTRY &amp; MILLWORK (Wood and Plastics)</b>				
<input type="checkbox"/> General Install	<input type="checkbox"/>			<input type="checkbox"/>
<input type="checkbox"/> Panelized Roofing System (GC)	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/> Interior Architectural Woodwork	<input type="checkbox"/>	<input type="checkbox"/>		
<b>Division 7: THERMAL AND MOISTURE PROTECTION</b>				
<input type="checkbox"/> Exterior Insulation and Finish System (if applicable)	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/> 5yr
<input type="checkbox"/> Metal Roof and Wall Panel Data		<input type="checkbox"/>		
<input type="checkbox"/> Skylight Data (if applicable)	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/> 5yr (from GO)
<input type="checkbox"/> Heat and Smoke Vents (if applicable)	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/> 5yr (from GO)
<input type="checkbox"/> Roof Hatch		<input type="checkbox"/>		
<b>Division 7: ROOFING (Thermal and Moisture Protection)</b>				
<input type="checkbox"/> Roofing System Warranty and Criteria		<input type="checkbox"/>		<input type="checkbox"/> 20yr Supply <input type="checkbox"/> 2yr Install
<b>Division 7: SEALANTS (Thermal and Moisture Protection)</b>				
<input type="checkbox"/> Exterior Joint Sealer Product Data		<input type="checkbox"/>		<input type="checkbox"/> 1yr
<input type="checkbox"/> Interior Joint Sealer Product Data		<input type="checkbox"/>		<input type="checkbox"/> 1yr
<input type="checkbox"/> Floor Sealer Product Data		<input type="checkbox"/>		<input type="checkbox"/> 1yr
<b>Division 8: DOORS &amp; HARDWARE (Doors and Windows)</b>				
<input type="checkbox"/> Automatic Sliding Door Drawings Operation Information		<input type="checkbox"/>		<input type="checkbox"/>
<input type="checkbox"/> Traffic Door Manuals	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/> Overhead Rolling Door Shop Drawings & Information		<input type="checkbox"/>		<input type="checkbox"/> 16 Mo Fixt
<input type="checkbox"/> Hollow Metal Door & Frame Schedule		<input type="checkbox"/>		
<input type="checkbox"/> Schedule of Finish Hardware		<input type="checkbox"/>		<input type="checkbox"/> 10yr Closers <input type="checkbox"/> 1yr Hardware
<b>Division 8: GLASS &amp; GLAZING SYSTEMS (Doors and Windows)</b>				



**Construction Specification****PROJECT CLOSEOUT**

(SPECIFICATION SECTION)	N/A	Letter of Conformance	Product Data	Warranty Letter
<input type="checkbox"/> Item				
<input type="checkbox"/> Storefront Framing & Glass Drawings and Product Info with Layout		<input type="checkbox"/>		<input type="checkbox"/>
<b>Division 9: FLOORING &amp; BASE (Finishes)</b>				
<input type="checkbox"/> Ceramic Tile Product Literature and Color Sheet		<input type="checkbox"/>		
<input type="checkbox"/> Acoustical Ceiling Panels		<input type="checkbox"/>		
<input type="checkbox"/> Vinyl Base		<input type="checkbox"/>		
<input type="checkbox"/> Fiberglass Reinforced Plastic Wall Panels (FRP)		<input type="checkbox"/>		<input type="checkbox"/> 1yr (from GO)
<b>Division 9: PAINTING &amp; COATINGS (Finishes)</b>				
<input type="checkbox"/> Specifications Interior & Exterior		<input type="checkbox"/>		<input type="checkbox"/> 1yr Application <input type="checkbox"/> 7yr Orange Stripe
<b>Division 10: TOILET PARTITIONS &amp; ACCESSORIES (Specialties)</b>				
<input type="checkbox"/> Toilet Partitions and Restroom Countertops				<input type="checkbox"/> 25yr
<input type="checkbox"/> Product Literature and Drawing		<input type="checkbox"/>		
<input type="checkbox"/> Accessories Schedule		<input type="checkbox"/>		
<input type="checkbox"/> Mirror with Stainless Steel Frame		<input type="checkbox"/>		
<input type="checkbox"/> Stainless Steel Grab Bars		<input type="checkbox"/>		
<input type="checkbox"/> Baby Changing Station		<input type="checkbox"/>		
<b>Division 10: FENCING</b>				
<input type="checkbox"/> Product Literature and Drawing			<input type="checkbox"/>	<input type="checkbox"/> 1yr (from GO)
<b>Division 11: LOADING DOCK EQUIPMENT</b>				
<input type="checkbox"/> Dock Leveler Product Data		<input type="checkbox"/>		
<input type="checkbox"/> Dock Seal Product Data		<input type="checkbox"/>		
<input type="checkbox"/> Dock Hood Product Data		<input type="checkbox"/>		
<b>Division 13: SPECIAL CONSTRUCTION</b>				
<input type="checkbox"/> Pass-Thru Receiver Product Literature		<input type="checkbox"/>		
<input type="checkbox"/> Garden Center Structure Manuals and Shop Drawings (Identify Manufacturer and Contact)			<input type="checkbox"/> As-Built	<input type="checkbox"/> 1yr (from GO) or; <input type="checkbox"/> 16mo (from Delivery)
<b>Division 15: PLUMBING</b>				
<input type="checkbox"/> General Install				<input type="checkbox"/> 1yr (from GO)
<input type="checkbox"/> Lavatory		<input type="checkbox"/>		
<input type="checkbox"/> Water Closet		<input type="checkbox"/>		
<input type="checkbox"/> Water Heater		<input type="checkbox"/>		
<input type="checkbox"/> Drinking Fountain		<input type="checkbox"/>		
<input type="checkbox"/> Urinal		<input type="checkbox"/>		
<input type="checkbox"/> Urinal Flush Valve		<input type="checkbox"/>		
<input type="checkbox"/> Closet Valve		<input type="checkbox"/>		
<input type="checkbox"/> Trap Primers		<input type="checkbox"/>		
<input type="checkbox"/> Wall Hydrants		<input type="checkbox"/>		
<input type="checkbox"/> Sump Pump (If Applicable)	<input type="checkbox"/>		<input type="checkbox"/>	
<input type="checkbox"/> Emergency Eye Wash		<input type="checkbox"/>		
<input type="checkbox"/> Roof Drains		<input type="checkbox"/>		
<input type="checkbox"/> Water Arrestors		<input type="checkbox"/>		
<input type="checkbox"/> Trench Drain		<input type="checkbox"/>		
<input type="checkbox"/> Bar Sink		<input type="checkbox"/>		
<input type="checkbox"/> Floor Drains		<input type="checkbox"/>		
<input type="checkbox"/> Traps		<input type="checkbox"/>		
<input type="checkbox"/> Expansion Tank		<input type="checkbox"/>		
<input type="checkbox"/> Hose Reels		<input type="checkbox"/>		
<input type="checkbox"/> Hose Bibs		<input type="checkbox"/>		
<input type="checkbox"/> TRC Oil Interceptor		<input type="checkbox"/>		
<input type="checkbox"/> Water Pressure Regulator		<input type="checkbox"/>		
<input type="checkbox"/> Backflow Preventer		<input type="checkbox"/>		

**Construction Specification****PROJECT CLOSEOUT**

(SPECIFICATION SECTION) <input type="checkbox"/> Item	N/A	Letter of Conformance	Product Data	Warranty Letter
<b>Division 15: HEATING &amp; AIR CONDITIONING</b>				
<input type="checkbox"/> General Install				<input type="checkbox"/> 1yr (from GO)
<input type="checkbox"/> Trouble Shooting Guide	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/> Unit Heaters Information		<input type="checkbox"/>		
<input type="checkbox"/> Radiant Heaters	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/> RTU Information		<input type="checkbox"/>		
<input type="checkbox"/> Exhaust Fan Schedule		<input type="checkbox"/>		
<input type="checkbox"/> Roof Ventilator (if applicable)	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/> Smoke Fans (If Applicable)	<input type="checkbox"/>	<input type="checkbox"/>		
<input type="checkbox"/> Sidewall Fan			<input type="checkbox"/>	
<input type="checkbox"/> Grille, Register & Diffuser Literature		<input type="checkbox"/>		
<input type="checkbox"/> Air Balance Report			<input type="checkbox"/>	
<b>Division 15: FIRE PROTECTION</b>				
<input type="checkbox"/> Practice for the Inspection, Testing & Maintenance of Sprinkler Systems			<input type="checkbox"/>	
<input type="checkbox"/> Swing Check Valve		<input type="checkbox"/>		
<input type="checkbox"/> O.S. & Y. Gate Valve		<input type="checkbox"/>		
<input type="checkbox"/> Tamper Switches		<input type="checkbox"/>		
<input type="checkbox"/> Flow Switches		<input type="checkbox"/>		
<input type="checkbox"/> Fire Sprinkler System Air Compressors		<input type="checkbox"/>		
<input type="checkbox"/> Fire Pump Manual		<input type="checkbox"/>		
<input type="checkbox"/> Fire Pump Data		<input type="checkbox"/>		
<input type="checkbox"/> Fire Pump Tests Results		<input type="checkbox"/>		
<input type="checkbox"/> Jockey Pump		<input type="checkbox"/>		
<input type="checkbox"/> Controllers Manual		<input type="checkbox"/>		
<b>Division 16: ELECTRICAL</b>				
<input type="checkbox"/> General Install				<input type="checkbox"/> 1yr (from GO)
<input type="checkbox"/> Lighting Supplier (list)			<input type="checkbox"/>	
<input type="checkbox"/> Panel Supplier (list)			<input type="checkbox"/>	
<input type="checkbox"/> Generator (with Maintenance Start-Up Procedures)		<input type="checkbox"/>		
<input type="checkbox"/> Battery Charger		<input type="checkbox"/>		
<input type="checkbox"/> Transfer Switches		<input type="checkbox"/>		
<input type="checkbox"/> Paddle Fans		<input type="checkbox"/>		
<input type="checkbox"/> Heat Trace	<input type="checkbox"/>	<input type="checkbox"/>		
<b>Division 16: SPECIAL SYSTEMS</b>				
<input type="checkbox"/> Fire Alarm Systems Operation		<input type="checkbox"/>		<input type="checkbox"/>
<input type="checkbox"/> Security Alarm Systems Operation		<input type="checkbox"/>		<input type="checkbox"/>
<input type="checkbox"/> EMS System Checklist			<input type="checkbox"/>	
<b>MISCELLANEOUS</b>				
<input type="checkbox"/> Knox Vault Product Literature			<input type="checkbox"/>	

## THE HOME DEPOT

## TURNOVER AND CLOSEOUT LOG

Description	Responsible Party	Done (x)	Dates			Remarks
			Commitment	Revised	Actual	
Utilities						
Water Valve Keys to Store Manager	Contractor					
Store Manager aware of meter locations	Contractor					
Store Manager Educated on operational items (i.e. risers, sprinklers, valves, special devices)	Contractor					
SWPPP (Storm Water) finalized and closed with local municipality or EPA	Contractor/ Owner					
Utility transfers complete & PM verified with Utility Co. of transfer	Contractor					
Gas Meter Account #						
Phone #	Contractor					
Electric Meter Account #						
Phone #	Contractor					
Water Meter Account #						
Phone #	Contractor					
Landscape Meter Account #						
Phone #	Contractor					
Prenova sent Utility information to Home Depot	Contractor					
Administration						
Final C.O. Analysis Received	Owner					
Final payment verified	Owner					
Final payment and C.O. agree	Contractor					
Change Order / Work Order Log 100% complete and balances with Final Payment Application	Owner					
Final liens of subs and GC received (originals required) & verified with sub list	Contractor					
Subcontractor list posted to Exesite	Contractor					
Schedule of Values / Payment Application in final application form	Owner					
Contractor listing (company name, contact name, address, phone, e-mail address)	Contractor					
Copy of all Bonds, Letters of Credit received	Contractor					
Title search by Attorney	Owner					
Current Site Plan posted to Exesite under section D01	Owner					
Determination of local lien law filing & Notice of Completion filed with local municipality if required	Owner					
Operational Restrictions hanging in Manager's office at store and posted to Exesite in section L02	Owner					
Credit Due Report Complete	Owner					
Invoice & letter sent to developer/owner	Owner					
Reimbursements Received	Owner					
Training Report letter of what was covered and who attended the training of all equipment, valves, shutdown etc. (Checklist type preferred)	Contractor					
ACCRUENT Pre-Punch Walk Questionnaire Complete	Owner					
Permits						
C.O. original in store (Verify w/ store)	Owner					
Certificate of Occupancy copy received and attached to Final Payment Application	Contractor					
Copy of all permits issued posted to Exesite in section D08	Contractor					

**Construction Specification****PROJECT CLOSEOUT**

Description	Responsible Party	Done (x)	Dates			Remarks
			Commitment	Revised	Actual	
<b>Punch lists</b>						
All punch lists shall be posted to Exesite in section J04.	Contractor					
Contractor's preliminary punch list	Contractor					
Civil (including landscape & irrigation) punch list complete	Contractor/ Owner					
Architect Punch List (initial & final) complete & signed off by Home Depot PM or Architect	Contractor/ Owner					
EMSCC Punch List (initial & final) complete & signed off by EMSCC consultant	Contractor/ Owner					
Telgian Punch List (initial & final) complete & signed off by Telgian	Contractor/ Owner					
Retaining Wall punch list (if applicable)	Contractor					
Building Services 2 week walk & signed off by PM / Building Services Manager	Owner					
Three Way punch from city/state agency received and complete and letter received	Contractor/ Owner					
<b>As builds</b>						
All As-Built Drawings shall be posted to Exesite in section L01	Contractor					
Civil Drawings	Contractor					
Site Lighting Drawings	Contractor					
Irrigation Drawings	Contractor					
Landscape Drawings	Contractor					
Structural Drawings	Contractor					
Architectural Drawings	Contractor					
Garden Center Drawings	Contractor					
Plumbing Drawings	Contractor					
Mechanical Drawings	Contractor					
Electrical Drawings	Contractor					
Fire and Burglar Alarm Drawings	Contractor					
Fire Sprinkler Drawings	Contractor					
Copy of As-Built in Electrical Room at store	Contractor					
<b>Warranty / Letter of Conformances – Product Data</b>						
All Warranty Information shall be posted to Exesite in section L04	Contractor					
All approvals completed from Architect in Exesite	Owner					
Contractor Overall Warranty	Contractor					
Subcontractor warranty received & verified with sub list for all items identified within this section	Contractor					
Division 2: Site Work & Landscaping						
Termite Letter – Warranty Letter	Contractor					
Site Utilities (Fire Department Inlet Connections) – Product Data	Contractor					
Site Utilities (Fire Hydrants) – Product Data	Contractor					
Asphalt, Concrete Paving – Warranty Letter	Contractor					
Pavement Markings – Warranty Letter / Letter of Conformance	Contractor					
Storm Drainage System – Product Data	Contractor					
Irrigation System Information - Warranty Letter / Letter of Conformance	Contractor					
Landscape Information (Trees and Shrubs) – Warranty Letter	Contractor					
Landscape Information (Plants) – Warranty Letter	Contractor					
Division 3: Concrete						
Cast in Place, Slab, Precast, Tilt-up Material – Warranty Letter	Contractor					
Cast in Place, Slab, Precast, Tilt-up Labor – Warranty Letter	Contractor					
Division 4: Concrete						
Certificate of ASTM compliance from reinforcing	Contractor					

**Construction Specification****PROJECT CLOSEOUT**

Description	Responsible Party	Done (x)	Dates			Remarks
			Commitment	Revised	Actual	
manufacturer – Warranty Letter						
Block Type, Color, and Supplier Information – Product Data	Contractor					
Insulation Data – Letter of Conformance	Contractor					
Division 5: Steel & Metals						
General Install – Warranty Letter	Contractor					
Welded Deck Certification – Letter of Conformance	Contractor					
Joist Schedule – Letter of Conformance	Contractor					
Joist Girder & Column Schedules - Letter of Conformance	Contractor					
Division 6: Carpentry & Millwork (wood and plastics)						
General Install – Warranty Letter	Contractor					
Panelized Roofing System(GC) – Letter of Conformance	Contractor					
Interior Architectural Woodwork – Letter of Conformance	Contractor					
Division 7: Thermal and Moisture Protection						
Exterior Insulation and Finish System (if applicable) – Letter of Conformance	Contractor					
Metal Roof and Wall Panel Data – Letter of Conformance	Contractor					
Skylight Data (if applicable) – Letter of Conformance	Contractor					
Heat and Smoke Vents (if applicable) – Letter of Conformance	Contractor					
Roof Hatch – Letter of Conformance	Contractor					
Division 7: Roofing (thermal and moisture protection)						
Roofing System Warranty and Criteria – Warranty Letter	Contractor					
Division 7: Sealants (thermal and moisture protection)						
Exterior Joint Sealer Product Data - - Warranty Letter / Letter of Conformance	Contractor					
Interior Joint Sealer Product Data - Warranty Letter / Letter of Conformance	Contractor					
Floor Sealer Product Data - Warranty Letter / Letter of Conformance	Contractor					
Division 8: Doors & Hardware (doors and windows)						
Automatic Sliding Door Drawings Operation Information - Warranty Letter / Letter of Conformance	Contractor					
Traffic Door Manuals – Letter of Conformance	Contractor					
Overhead Rolling Door Shop Drawings & Information - Warranty Letter / Letter of Conformance	Contractor					
Hollow Metal Door & Frame Schedule – Letter of Conformance	Contractor					
Schedule of Finish Hardware - Warranty Letter / Letter of Conformance	Contractor					
Division 8: Glass & Glazing Systems (doors and windows)						
Storefront Framing & Glass Drawings and Product Info with Layout - Warranty Letter / Letter of Conformance	Contractor					
Division 9: Flooring & Base (finishes)						
Ceramic Tile Product Literature and Color Sheet – Letter of Conformance	Contractor					
Acoustical Ceiling Panels – Letter of Conformance	Contractor					
Vinyl Base – Letter of Conformance	Contractor					
Fiberglass Reinforced Plastic Wall Panels (FRP) - Warranty Letter / Letter of Conformance	Contractor					

**Construction Specification****PROJECT CLOSEOUT**

Description	Responsible Party	Done (x)	Dates			Remarks
			Commitment	Revised	Actual	
<b>Division 9: Painting &amp; Coatings (finishes)</b>						
Specifications Interior & Exterior - Warranty Letter / Letter of Conformance	Contractor					
<b>Division 10: Toilet Partitions &amp; Accessories (specialties)</b>						
Toilet Partitions and Restroom Countertops – Warranty Letter	Contractor					
Product Literature and Drawing – Letter of Conformance	Contractor					
Accessories Schedule – Letter of Conformance	Contractor					
Mirror with Stainless Steel Frame – Letter of Conformance	Contractor					
Stainless Steel Grab Bars – Letter of Conformance	Contractor					
Baby Changing Station – Letter of Conformance	Contractor					
<b>Division 10: Fencing</b>						
Product Literature and Drawing – Warranty Letter / Product Data	Contractor					
<b>Division 11: Loading Dock Equipment</b>						
Dock Leveler Product Data – Letter of Conformance	Contractor					
Dock Seal Product Data – Letter of Conformance	Contractor					
Dock Hood Product Data – Letter of Conformance	Contractor					
<b>Division 13: Special Construction</b>						
Pass-Thru Receiver Product Literature – Letter of Conformance	Contractor					
Garden Center Structure Manuals and Shop Drawings (Identify Manufacturer and Contact) – Warranty Letter / Product Data	Contractor					
<b>Division 15: Plumbing</b>						
General Install – Letter of Conformance	Contractor					
Lavatory – Letter of Conformance	Contractor					
Water Closet – Letter of Conformance	Contractor					
Water Heater – Letter of Conformance	Contractor					
Drinking Fountain – Letter of Conformance	Contractor					
Urinal – Letter of Conformance	Contractor					
Urinal Flush Valve – Letter of Conformance	Contractor					
Closet Valve – Letter of Conformance	Contractor					
Trap Primers – Letter of Conformance	Contractor					
Wall Hydrants – Letter of Conformance	Contractor					
Sump Pump (If Applicable) – Product Data	Contractor					
Emergency Eye Wash – Letter of Conformance	Contractor					
Roof Drains – Letter of Conformance	Contractor					
Water Arrestors – Letter of Conformance	Contractor					
Trench Drain – Letter of Conformance	Contractor					
Bar Sink – Letter of Conformance	Contractor					
Floor Drains – Letter of Conformance	Contractor					
Traps – Letter of Conformance	Contractor					
Expansion Tank – Letter of Conformance	Contractor					
Hose Reels – Letter of Conformance	Contractor					
Hose Bibs – Letter of Conformance	Contractor					
TRC Oil Interceptor – Letter of Conformance	Contractor					
Water Pressure Regulator – Letter of Conformance	Contractor					
Backflow Preventer – Letter of Conformance	Contractor					
<b>Division 15: Heating &amp; Air Conditioning</b>						
General Install – Warranty Letter	Contractor					
Trouble Shooting Guide – Product Data	Contractor					
Unit Heaters Information – Letter of Conformance	Contractor					
Radiant Heaters – Letter of Conformance	Contractor					
RTU Information – Letter of Conformance	Contractor					
Exhaust Fan Schedule – Letter of Conformance	Contractor					
Roof Ventilator (if applicable) – Letter of Conformance	Contractor					

**Construction Specification****PROJECT CLOSEOUT**

Description	Responsible Party	Done (x)	Dates			Remarks
			Commitment	Revised	Actual	
Smoke Fans (If Applicable) – Letter of Conformance	Contractor					
Sidewall Fan – Product Data	Contractor					
Grille, Register & Diffuser Literature – Letter of Conformance	Contractor					
Air Balance Report – Product Data	Contractor					
<b>Division 15: Fire Protection</b>						
Practice for the Inspection, Testing & Maintenance of Sprinkler Systems – Warranty Manual	Contractor					
Swing Check Valve – Letter of Conformance	Contractor					
O.S. & Y. Gate Valve – Letter of Conformance	Contractor					
Tamper Switches – Letter of Conformance	Contractor					
Flow Switches – Letter of Conformance	Contractor					
Fire Sprinkler System Air Compressors – Letter of Conformance	Contractor					
Fire Pump Manual – Letter of Conformance	Contractor					
Fire Pump Data – Letter of Conformance	Contractor					
Fire Pump Tests Results – Letter of Conformance	Contractor					
Jockey Pump – Letter of Conformance	Contractor					
Controllers Manual – Letter of Conformance	Contractor					
<b>Division 16: Electrical</b>						
General Install – Warranty Letter	Contractor					
Lighting Supplier (list) – Product Data	Contractor					
Panel Supplier (list) – Product Data	Contractor					
Generator (with Maintenance Start-Up Procedures) – Letter of Conformance	Contractor					
Battery Charger – Letter of Conformance	Contractor					
Transfer Switches – Letter of Conformance	Contractor					
Paddle Fans – Letter of Conformance	Contractor					
Heat Trace – Letter of Conformance	Contractor					
<b>Division 16: Special Systems</b>						
Fire Alarm Systems Operation - Warranty Letter / Letter of Conformance	Contractor					
Security Alarm Systems Operation - Warranty Letter / Letter of Conformance	Contractor					
EMS System Checklist – Product Data	Contractor					
<b>Miscellaneous</b>						
Knox Vault Product Literature – Product Data	Contractor					
<b>Testing</b>						
Final letter received	Owner					
Materials testing report posted to Exesite	Owner					
Testing copies posted to Exesite	Owner					
Retaining wall inspection certification by wall engineer	Contractor					
<b>Miscellaneous items</b>						
EPA Notice of Termination filed by contractor	Contractor					
EPA Notice of Termination filed by owner	Owner					

## GRAND OPENING 2-WEEK WARRANTY WALK

YES NO N/A		Notes
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	1. <b>Building Paint:</b> Specified paint was used and applied correctly. Sandpaper test was performed on exterior orange.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	2. <b>Slab Condition:</b> Floor slab, including garden center, is in good condition with no spalling or abnormal cracking evident	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	3. <b>Slab Joints:</b> All joints are in good condition and cut level with slab.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	4. <b>Parking Lot Striping:</b> Parking Stalls are White – Caution Stalls are Yellow – Handicap Stalls are Blue and all have Two (2) coats.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	5. <b>Fire Protection System:</b> All lines are pitched towards the building and the drum drips are located in a heated area.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	6. <b>Fire Protection System:</b> Dry Valves can be serviced from an electrical ladder.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	7. <b>Safety Striping:</b> Striping is correctly located around carpet carousels, electrical panels, saws, etc.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	8. <b>Electrical Panels:</b> All Panels are correctly labeled and indexed with no missing covers or open slots.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	9. <b>HVAC Units:</b> All units are labeled correctly on the roof and on the drum diffuser in the store.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	10. <b>Electric Pulse Meter:</b> Pulse meter is installed and working properly.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	11. <b>Garden Center – Gates:</b> Gates work smoothly and have Four (4) hinges properly installed.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	12. <b>Garden Center – Drainage:</b> Area drains properly with no ponding.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	13. <b>Garden Center – Racking:</b> All racking is installed at least 12" from fencing to reduce damage.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	14. <b>Landscaping – Plant Material:</b> Trees, shrubs and turf installed properly, and is alive and healthy.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	15. <b>Landscaping – Topsoil:</b> Topsoil has sufficient depth to allow proper plant growth, with no erosion evident.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	16. <b>Landscaping – Irrigation:</b> Irrigation system is fully operational.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	17. <b>Energy Management:</b> EMS <i>Start-Up Punchlist</i> complete.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	18. <b>In-Rack Equipment – Computers:</b> Confirm all equipment loads are on 24/7 power and do not turn off at night.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	19. <b>Display Lighting:</b> confirm all display lighting loads are controlled by EMS and turn off at night.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	20. <b>Sales Lights:</b> confirm all sales lights are operational and lighting pattern is acceptable.	

**NOTE:** All outstanding items identified above should be corrected within a two week timeframe of receiving notification of the task.



## 11-MONTH WARRANTY WALK

YES NO N/A		Notes
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	1. <b>Punchlist:</b> All items from the Architect's <i>GO and TVA</i> Inspections have been completed.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	2. <b>Slab Condition:</b> Floor slab, including garden center, is in good condition with no spalling or abnormal cracking evident.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	3. <b>Slab Joints:</b> All joints are in good condition, with no defects evident.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	4. <b>Slab Joints:</b> Filler is present, in good condition with no defects evident.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	5. <b>Paint:</b> All surfaces are in good condition and painted in spec colors. Bar joists and beams are free of rust with no coverage problems.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	6. <b>Concrete to Asphalt Transition:</b> Surfaces are in good condition, with no evident defects or abnormal cracking.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	7. <b>Roof:</b> Store reports no active leaks and none are evident from inspection.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	8. <b>Restrooms:</b> Ceramic tile is secure, with no major defects evident.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	9. <b>Tilt-Up Panels:</b> Panels are secure and show no evident signs of movement.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	10. <b>Tilt-Up Joints:</b> Sealants are intact with no shrinking or failure.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	11. <b>Fire Panel:</b> Panel is fully operational with no troubles or alarms.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	12. <b>Garden Center Drainage:</b> Garden Center drains properly with no ponding.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	13. <b>Settling:</b> Building and sidewalks show no evidence of abnormal settlement.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	14. <b>Landscaping:</b> All plant material and turf is alive and healthy.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	15. <b>Landscaping:</b> Topsoil is in place, with no erosion evident.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	16. <b>Landscaping:</b> Irrigation system is operational with good coverage.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	17. <b>Sealants:</b> Sealants are in place and in good condition at building / curb and around all exterior openings.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	18. <b>Parking Lot:</b> All paved surfaces drain properly.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	19. <b>Parking Lot:</b> Asphalt and concrete surfaces are in good condition with no abnormal cracking or wear.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	20. <b>Energy Management:</b> Confirm all sales light fixtures operational.	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	21. <b>Energy Management:</b> <i>Start-Up Punchlist</i> is complete.	

**NOTE:** All outstanding items identified above should be corrected within a two week timeframe of receiving notification of the task.

END OF SECTION

**Contractor's Letter of Conformance****Division 2 – Site Work & Landscaping**

Project Location: \_\_\_\_\_

Date: \_\_\_\_\_

City: \_\_\_\_\_

State: \_\_\_\_\_

Project Number: \_\_\_\_\_

Store Number: \_\_\_\_\_

The following equipment / product has been inspected and approved:

- Pavement Markings                      Product Mfg and Model: \_\_\_\_\_
- Irrigation System Information        Product Mfg and Model: \_\_\_\_\_

## Statement of Conformance:

The undersigned hereby declares that the Product identified above by manufacturer's name and model number is (one of) the product(s) specified and is suitable for the intended use as defined within the Contract Documents and has been provided and placed in operational condition by a manufacturer's authorized installer and in accordance with the manufacturer's published instructions and the Contract Documents.

## SUPPLIER:

\_\_\_\_\_  
(Contact name of supplier offering above product)                      Phone Number: (    ) \_\_\_\_\_

\_\_\_\_\_  
(Supplier name and address)

## SUBCONTRACTOR (MANUFACTURER'S AUTHORIZED INSTALLER):

\_\_\_\_\_  
(Contact name of subcontractor installing above product)                      Phone Number: (    ) \_\_\_\_\_

\_\_\_\_\_  
(Subcontractor name and address)

## PRIME CONTRACTOR:

\_\_\_\_\_  
(Contact name of Contractor)                      (Contractor signature and Title of Signatory)

**Contractor's Letter of Conformance  
Division 4 – Masonry**

Project Location: \_\_\_\_\_

Date: \_\_\_\_\_

City: \_\_\_\_\_

State: \_\_\_\_\_

Project Number: \_\_\_\_\_

Store Number: \_\_\_\_\_

The following equipment / product has been inspected and approved:

- Insulation Data                      Product Mfg and Model: \_\_\_\_\_

## Statement of Conformance:

The undersigned hereby declares that the Product identified above by manufacturer's name and model number is (one of) the product(s) specified and is suitable for the intended use as defined within the Contract Documents and has been provided and placed in operational condition by a manufacturer's authorized installer and in accordance with the manufacturer's published instructions and the Contract Documents.

## SUPPLIER:

\_\_\_\_\_  
(Contact name of supplier offering above product)                      Phone Number: (    ) \_\_\_\_\_

\_\_\_\_\_  
(Supplier name and address)

## SUBCONTRACTOR (MANUFACTURER'S AUTHORIZED INSTALLER):

\_\_\_\_\_  
(Contact name of subcontractor installing above product)                      Phone Number: (    ) \_\_\_\_\_

\_\_\_\_\_  
(Subcontractor name and address)

## PRIME CONTRACTOR:

\_\_\_\_\_  
(Contact name of Contractor)                      (Contractor signature and Title of Signatory)

**Contractor's Letter of Conformance****Division 5 – Steel & Metals**

Project Location: \_\_\_\_\_

Date: \_\_\_\_\_

City: \_\_\_\_\_

State: \_\_\_\_\_

Project Number: \_\_\_\_\_

Store Number: \_\_\_\_\_

The following equipment / product has been inspected and approved:

- |                                   |                              |
|-----------------------------------|------------------------------|
| ▪ Welding Deck Certification      | Product Mfg and Model: _____ |
| ▪ Joist Schedule                  | Product Mfg and Model: _____ |
| ▪ Joist Girder & Column Schedules | Product Mfg and Model: _____ |

## Statement of Conformance:

The undersigned hereby declares that the Product identified above by manufacturer's name and model number is (one of) the product(s) specified and is suitable for the intended use as defined within the Contract Documents and has been provided and placed in operational condition by a manufacturer's authorized installer and in accordance with the manufacturer's published instructions and the Contract Documents.

## SUPPLIER:

\_\_\_\_\_  
(Contact name of supplier offering above product)

Phone Number: (    ) \_\_\_\_\_

\_\_\_\_\_  
(Supplier name and address)

## SUBCONTRACTOR (MANUFACTURER'S AUTHORIZED INSTALLER):

\_\_\_\_\_  
(Contact name of subcontractor installing above product)

Phone Number: (    ) \_\_\_\_\_

\_\_\_\_\_  
(Subcontractor name and address)

## PRIME CONTRACTOR:

\_\_\_\_\_  
(Contact name of Contractor)

\_\_\_\_\_  
(Contractor signature and Title of Signatory)

**Contractor's Letter of Conformance****Division 6 – Carpentry & Millwork**

Project Location: \_\_\_\_\_

Date: \_\_\_\_\_

City: \_\_\_\_\_

State: \_\_\_\_\_

Project Number: \_\_\_\_\_

Store Number: \_\_\_\_\_

The following equipment / product has been inspected and approved:

- Panelized Roofing System (GC)      Product Mfg and Model: \_\_\_\_\_
- Interior Architectural Woodwork      Product Mfg and Model: \_\_\_\_\_

## Statement of Conformance:

The undersigned hereby declares that the Product identified above by manufacturer's name and model number is (one of) the product(s) specified and is suitable for the intended use as defined within the Contract Documents and has been provided and placed in operational condition by a manufacturer's authorized installer and in accordance with the manufacturer's published instructions and the Contract Documents.

## SUPPLIER:

\_\_\_\_\_  
(Contact name of supplier offering above product)      Phone Number: (    ) \_\_\_\_\_

\_\_\_\_\_  
(Supplier name and address)

## SUBCONTRACTOR (MANUFACTURER'S AUTHORIZED INSTALLER):

\_\_\_\_\_  
(Contact name of subcontractor installing above product)      Phone Number: (    ) \_\_\_\_\_

\_\_\_\_\_  
(Subcontractor name and address)

## PRIME CONTRACTOR:

\_\_\_\_\_  
(Contact name of Contractor)      (Contractor signature and Title of Signatory)

**Contractor's Letter of Conformance  
Division 7 – Thermal and Moisture Protection**

Project Location: \_\_\_\_\_

Date: \_\_\_\_\_

City: \_\_\_\_\_

State: \_\_\_\_\_

Project Number: \_\_\_\_\_

Store Number: \_\_\_\_\_

The following equipment / product has been inspected and approved:

- |   |                              |
|---|------------------------------|
| ▪ Exterior Insulation & Finish System (if applicable) | Product Mfg and Model: _____ |
| ▪ Metal Roof and Wall Panel Data                      | Product Mfg and Model: _____ |
| ▪ Skylight Data (if applicable)                       | Product Mfg and Model: _____ |
| ▪ Heat & Smoke Vents (if applicable)                  | Product Mfg and Model: _____ |
| ▪ Roof Hatch  | Product Mfg and Model: _____ |

## Statement of Conformance:

The undersigned hereby declares that the Product identified above by manufacturer's name and model number is (one of) the product(s) specified and is suitable for the intended use as defined within the Contract Documents and has been provided and placed in operational condition by a manufacturer's authorized installer and in accordance with the manufacturer's published instructions and the Contract Documents.

## SUPPLIER:

\_\_\_\_\_  
(Contact name of supplier offering above product)

Phone Number: (    ) \_\_\_\_\_

\_\_\_\_\_  
(Supplier name and address)

## SUBCONTRACTOR (MANUFACTURER'S AUTHORIZED INSTALLER):

\_\_\_\_\_  
(Contact name of subcontractor installing above product)

Phone Number: (    ) \_\_\_\_\_

\_\_\_\_\_  
(Subcontractor name and address)

## PRIME CONTRACTOR:

\_\_\_\_\_  
(Contact name of Contractor)

\_\_\_\_\_  
(Contractor signature and Title of Signatory)

**Contractor's Letter of Conformance****Division 7 – Roofing**

Project Location: \_\_\_\_\_

Date: \_\_\_\_\_

City: \_\_\_\_\_

State: \_\_\_\_\_

Project Number: \_\_\_\_\_

Store Number: \_\_\_\_\_

The following equipment / product has been inspected and approved:

- Roofing System Warranty and Criteria      Product Mfg and Model: \_\_\_\_\_

## Statement of Conformance:

The undersigned hereby declares that the Product identified above by manufacturer's name and model number is (one of) the product(s) specified and is suitable for the intended use as defined within the Contract Documents and has been provided and placed in operational condition by a manufacturer's authorized installer and in accordance with the manufacturer's published instructions and the Contract Documents.

## SUPPLIER:

\_\_\_\_\_  
(Contact name of supplier offering above product)      Phone Number: (    ) \_\_\_\_\_

\_\_\_\_\_  
(Supplier name and address)

## SUBCONTRACTOR (MANUFACTURER'S AUTHORIZED INSTALLER):

\_\_\_\_\_  
(Contact name of subcontractor installing above product)      Phone Number: (    ) \_\_\_\_\_

\_\_\_\_\_  
(Subcontractor name and address)

## PRIME CONTRACTOR:

\_\_\_\_\_  
(Contact name of Contractor)      (Contractor signature and Title of Signatory)

**Contractor's Letter of Conformance****Division 7 – Sealants**

Project Location: \_\_\_\_\_

Date: \_\_\_\_\_

City: \_\_\_\_\_

State: \_\_\_\_\_

Project Number: \_\_\_\_\_

Store Number: \_\_\_\_\_

The following equipment / product has been inspected and approved:

- |                                      |                              |
|--------------------------------------|------------------------------|
| ▪ Exterior Joint Sealer Product Data | Product Mfg and Model: _____ |
| ▪ Interior Joint Sealer Product Data | Product Mfg and Model: _____ |
| ▪ Floor Sealer Product Data          | Product Mfg and Model: _____ |

## Statement of Conformance:

The undersigned hereby declares that the Product identified above by manufacturer's name and model number is (one of) the product(s) specified and is suitable for the intended use as defined within the Contract Documents and has been provided and placed in operational condition by a manufacturer's authorized installer and in accordance with the manufacturer's published instructions and the Contract Documents.

## SUPPLIER:

\_\_\_\_\_  
(Contact name of supplier offering above product)

Phone Number: (    ) \_\_\_\_\_

\_\_\_\_\_  
(Supplier name and address)

## SUBCONTRACTOR (MANUFACTURER'S AUTHORIZED INSTALLER):

\_\_\_\_\_  
(Contact name of subcontractor installing above product)

Phone Number: (    ) \_\_\_\_\_

\_\_\_\_\_  
(Subcontractor name and address)

## PRIME CONTRACTOR:

\_\_\_\_\_  
(Contact name of Contractor)

\_\_\_\_\_  
(Contractor signature and Title of Signatory)



**Contractor's Letter of Conformance****Division 8 – Doors & Hardware**

Project Location: \_\_\_\_\_

Date: \_\_\_\_\_

City: \_\_\_\_\_

State: \_\_\_\_\_

Project Number: \_\_\_\_\_

Store Number: \_\_\_\_\_

The following equipment / product has been inspected and approved:

- |   |                              |
|---|------------------------------|
| ▪ Automatic Sliding Door Drawings Operation Info. | Product Mfg and Model: _____ |
| ▪ Traffic Door Manuals                            | Product Mfg and Model: _____ |
| ▪ Overhead Rolling Door Shop Dwgs & Info          | Product Mfg and Model: _____ |
| ▪ Hollow Metal Door & Frame Schedule              | Product Mfg and Model: _____ |
| ▪ Schedule of Finish Hardware                     | Product Mfg and Model: _____ |

## Statement of Conformance:

The undersigned hereby declares that the Product identified above by manufacturer's name and model number is (one of) the product(s) specified and is suitable for the intended use as defined within the Contract Documents and has been provided and placed in operational condition by a manufacturer's authorized installer and in accordance with the manufacturer's published instructions and the Contract Documents.

## SUPPLIER:

\_\_\_\_\_  
(Contact name of supplier offering above product)

Phone Number: (    ) \_\_\_\_\_

\_\_\_\_\_  
(Supplier name and address)

## SUBCONTRACTOR (MANUFACTURER'S AUTHORIZED INSTALLER):

\_\_\_\_\_  
(Contact name of subcontractor installing above product)

Phone Number: (    ) \_\_\_\_\_

\_\_\_\_\_  
(Subcontractor name and address)

## PRIME CONTRACTOR:

\_\_\_\_\_  
(Contact name of Contractor)

\_\_\_\_\_  
(Contractor signature and Title of Signatory)

**Contractor's Letter of Conformance  
Division 8 – Glass & Glazing Systems**

Project Location: \_\_\_\_\_

Date: \_\_\_\_\_

City: \_\_\_\_\_

State: \_\_\_\_\_

Project Number: \_\_\_\_\_

Store Number: \_\_\_\_\_

The following equipment / product has been inspected and approved:

- Storefront Framing & Glass Dwgs (Product Info w/Layout) Product Mfg and Model: \_\_\_\_\_

**Statement of Conformance:**

The undersigned hereby declares that the Product identified above by manufacturer's name and model number is (one of) the product(s) specified and is suitable for the intended use as defined within the Contract Documents and has been provided and placed in operational condition by a manufacturer's authorized installer and in accordance with the manufacturer's published instructions and the Contract Documents.

**SUPPLIER:**\_\_\_\_\_  
(Contact name of supplier offering above product) Phone Number: ( ) \_\_\_\_\_\_\_\_\_\_  
(Supplier name and address)**SUBCONTRACTOR (MANUFACTURER'S AUTHORIZED INSTALLER):**\_\_\_\_\_  
(Contact name of subcontractor installing above product) Phone Number: ( ) \_\_\_\_\_\_\_\_\_\_  
(Subcontractor name and address)**PRIME CONTRACTOR:**\_\_\_\_\_  
(Contact name of Contractor) (Contractor signature and Title of Signatory)

**Contractor's Letter of Conformance****Division 9 – Flooring & Base**

Project Location: \_\_\_\_\_

Date: \_\_\_\_\_

City: \_\_\_\_\_

State: \_\_\_\_\_

Project Number: \_\_\_\_\_

Store Number: \_\_\_\_\_

The following equipment / product has been inspected and approved:

- Ceramic Tile Product Literature & Color Sheet    Product Mfg and Model: \_\_\_\_\_
- Acoustical Ceiling Panels    Product Mfg and Model: \_\_\_\_\_
- Vinyl Base    Product Mfg and Model: \_\_\_\_\_
- Fiberglass Reinforced Plastic Wall Panels (FRP)    Product Mfg and Model: \_\_\_\_\_

## Statement of Conformance:

The undersigned hereby declares that the Product identified above by manufacturer's name and model number is (one of) the product(s) specified and is suitable for the intended use as defined within the Contract Documents and has been provided and placed in operational condition by a manufacturer's authorized installer and in accordance with the manufacturer's published instructions and the Contract Documents.

## SUPPLIER:

\_\_\_\_\_  
(Contact name of supplier offering above product)      Phone Number: (    ) \_\_\_\_\_

\_\_\_\_\_  
(Supplier name and address)

## SUBCONTRACTOR (MANUFACTURER'S AUTHORIZED INSTALLER):

\_\_\_\_\_  
(Contact name of subcontractor installing above product)      Phone Number: (    ) \_\_\_\_\_

\_\_\_\_\_  
(Subcontractor name and address)

## PRIME CONTRACTOR:

\_\_\_\_\_  
(Contact name of Contractor)      (Contractor signature and Title of Signatory)

**Contractor's Letter of Conformance****Division 9 – Painting & Coating**

Project Location: \_\_\_\_\_

Date: \_\_\_\_\_

City: \_\_\_\_\_

State: \_\_\_\_\_

Project Number: \_\_\_\_\_

Store Number: \_\_\_\_\_

The following equipment / product has been inspected and approved:

- Specifications Interior and Exterior                      Product Mfg and Model: \_\_\_\_\_

## Statement of Conformance:

The undersigned hereby declares that the Product identified above by manufacturer's name and model number is (one of) the product(s) specified and is suitable for the intended use as defined within the Contract Documents and has been provided and placed in operational condition by a manufacturer's authorized installer and in accordance with the manufacturer's published instructions and the Contract Documents.

## SUPPLIER:

\_\_\_\_\_  
(Contact name of supplier offering above product)                      Phone Number: (    ) \_\_\_\_\_\_\_\_\_\_  
(Supplier name and address)

## SUBCONTRACTOR (MANUFACTURER'S AUTHORIZED INSTALLER):

\_\_\_\_\_  
(Contact name of subcontractor installing above product)                      Phone Number: (    ) \_\_\_\_\_\_\_\_\_\_  
(Subcontractor name and address)

## PRIME CONTRACTOR:

\_\_\_\_\_  
(Contact name of Contractor)                      (Contractor signature and Title of Signatory)



**Contractor's Letter of Conformance**  
**Division 10 – Toilet Partitions & Accessories**

Project Location: \_\_\_\_\_

Date: \_\_\_\_\_

City: \_\_\_\_\_

State: \_\_\_\_\_

Project Number: \_\_\_\_\_

Store Number: \_\_\_\_\_

The following equipment / product has been inspected and approved:

- |                                     |                              |
|-------------------------------------|------------------------------|
| ▪ Product Literature and Drawing    | Product Mfg and Model: _____ |
| ▪ Accessories Schedule              | Product Mfg and Model: _____ |
| ▪ Mirror with Stainless Steel Frame | Product Mfg and Model: _____ |
| ▪ Stainless Steel Grab Bars         | Product Mfg and Model: _____ |
| ▪ Baby Changing Station             | Product Mfg and Model: _____ |

**Statement of Conformance:**

The undersigned hereby declares that the Product identified above by manufacturer's name and model number is (one of) the product(s) specified and is suitable for the intended use as defined within the Contract Documents and has been provided and placed in operational condition by a manufacturer's authorized installer and in accordance with the manufacturer's published instructions and the Contract Documents.

**SUPPLIER:**

\_\_\_\_\_  
(Contact name of supplier offering above product)

Phone Number: (    ) \_\_\_\_\_

\_\_\_\_\_  
(Supplier name and address)

**SUBCONTRACTOR (MANUFACTURER'S AUTHORIZED INSTALLER):**

\_\_\_\_\_  
(Contact name of subcontractor installing above product)

Phone Number: (    ) \_\_\_\_\_

\_\_\_\_\_  
(Subcontractor name and address)

**PRIME CONTRACTOR:**

\_\_\_\_\_  
(Contact name of Contractor)

\_\_\_\_\_  
(Contractor signature and Title of Signatory)



**Contractor's Letter of Conformance**  
**Division 11 – Loading Dock Equipment**

Project Location: \_\_\_\_\_

Date: \_\_\_\_\_

City: \_\_\_\_\_

State: \_\_\_\_\_

Project Number: \_\_\_\_\_

Store Number: \_\_\_\_\_

The following equipment / product has been inspected and approved:

- |                             |                              |
|-----------------------------|------------------------------|
| ▪ Dock Leveler Product Data | Product Mfg and Model: _____ |
| ▪ Dock Seal Product Data    | Product Mfg and Model: _____ |
| ▪ Dock Hood Product Data    | Product Mfg and Model: _____ |

**Statement of Conformance:**

The undersigned hereby declares that the Product identified above by manufacturer's name and model number is (one of) the product(s) specified and is suitable for the intended use as defined within the Contract Documents and has been provided and placed in operational condition by a manufacturer's authorized installer and in accordance with the manufacturer's published instructions and the Contract Documents.

**SUPPLIER:**

\_\_\_\_\_  
(Contact name of supplier offering above product)

Phone Number: (    ) \_\_\_\_\_

\_\_\_\_\_  
(Supplier name and address)

**SUBCONTRACTOR (MANUFACTURER'S AUTHORIZED INSTALLER):**

\_\_\_\_\_  
(Contact name of subcontractor installing above product)

Phone Number: (    ) \_\_\_\_\_

\_\_\_\_\_  
(Subcontractor name and address)

**PRIME CONTRACTOR:**

\_\_\_\_\_  
(Contact name of Contractor)

\_\_\_\_\_  
(Contractor signature and Title of Signatory)

**Contractor's Letter of Conformance****Division 13 – Special Construction**

Project Location: \_\_\_\_\_

Date: \_\_\_\_\_

City: \_\_\_\_\_

State: \_\_\_\_\_

Project Number: \_\_\_\_\_

Store Number: \_\_\_\_\_

The following equipment / product has been inspected and approved:

- Pass-Thru Receiver Product Literature      Product Mfg and Model: \_\_\_\_\_

## Statement of Conformance:

The undersigned hereby declares that the Product identified above by manufacturer's name and model number is (one of) the product(s) specified and is suitable for the intended use as defined within the Contract Documents and has been provided and placed in operational condition by a manufacturer's authorized installer and in accordance with the manufacturer's published instructions and the Contract Documents.

## SUPPLIER:

\_\_\_\_\_  
(Contact name of supplier offering above product)      Phone Number: (    ) \_\_\_\_\_

\_\_\_\_\_  
(Supplier name and address)

## SUBCONTRACTOR (MANUFACTURER'S AUTHORIZED INSTALLER):

\_\_\_\_\_  
(Contact name of subcontractor installing above product)      Phone Number: (    ) \_\_\_\_\_

\_\_\_\_\_  
(Subcontractor name and address)

## PRIME CONTRACTOR:

\_\_\_\_\_  
(Contact name of Contractor)      (Contractor signature and Title of Signatory)

**Contractor's Letter of Conformance  
Division 15 – Plumbing**

Project Location: \_\_\_\_\_

Date: \_\_\_\_\_

City: \_\_\_\_\_

State: \_\_\_\_\_

Project Number: \_\_\_\_\_

Store Number: \_\_\_\_\_

The following equipment / product has been inspected and approved:

▪ Lavatory	Product Mfg and Model: _____
▪ Water Closet	Product Mfg and Model: _____
▪ Water Heater	Product Mfg and Model: _____
▪ Drinking Fountain	Product Mfg and Model: _____
▪ Urinal	Product Mfg and Model: _____
▪ Urinal Flush Valve	Product Mfg and Model: _____
▪ Closet Valve	Product Mfg and Model: _____
▪ Trap Primers	Product Mfg and Model: _____
▪ Wall Hydrants	Product Mfg and Model: _____
▪ Emergency Eye Wash	Product Mfg and Model: _____
▪ Roof Drains	Product Mfg and Model: _____
▪ Water Arrestors	Product Mfg and Model: _____
▪ Trench Drain	Product Mfg and Model: _____
▪ Bar Sink	Product Mfg and Model: _____
▪ Floor Drains	Product Mfg and Model: _____
▪ Traps	Product Mfg and Model: _____
▪ Expansion Tank	Product Mfg and Model: _____
▪ Hose Reels	Product Mfg and Model: _____
▪ Hose Bibs	Product Mfg and Model: _____
▪ TRC Oil Interceptor	Product Mfg and Model: _____
▪ Water Pressure Regulator	Product Mfg and Model: _____
▪ Backflow Preventor	Product Mfg and Model: _____



## Statement of Conformance:

The undersigned hereby declares that the Product identified above by manufacturer's name and model number is (one of) the product(s) specified and is suitable for the intended use as defined within the Contract Documents and has been provided and placed in operational condition by a manufacturer's authorized installer and in accordance with the manufacturer's published instructions and the Contract Documents.

## SUPPLIER:

\_\_\_\_\_  
(Contact name of supplier offering above product)

Phone Number: (    ) \_\_\_\_\_

\_\_\_\_\_  
(Supplier name and address)

## SUBCONTRACTOR (MANUFACTURER'S AUTHORIZED INSTALLER):

\_\_\_\_\_  
(Contact name of subcontractor installing above product)

Phone Number: (    ) \_\_\_\_\_

\_\_\_\_\_  
(Subcontractor name and address)

## PRIME CONTRACTOR:

\_\_\_\_\_  
(Contact name of Contractor)

\_\_\_\_\_  
(Contractor signature and Title of Signatory)



**Contractor's Letter of Conformance**  
**Division 15 – Heating & Air Conditioning**

Project Location: \_\_\_\_\_

Date: \_\_\_\_\_

City: \_\_\_\_\_

State: \_\_\_\_\_

Project Number: \_\_\_\_\_

Store Number: \_\_\_\_\_

The following equipment / product has been inspected and approved:

- |  |                              |
|--|------------------------------|
| ▪ Unit Heaters Information               | Product Mfg and Model: _____ |
| ▪ Radiant Heaters                        | Product Mfg and Model: _____ |
| ▪ RTU Information                        | Product Mfg and Model: _____ |
| ▪ Exhaust Fan Schedule                   | Product Mfg and Model: _____ |
| ▪ Roof Ventilator (if applicable)        | Product Mfg and Model: _____ |
| ▪ Smoke Fans (if applicable)             | Product Mfg and Model: _____ |
| ▪ Grille, Register & Diffuser Literature | Product Mfg and Model: _____ |

Statement of Conformance:

The undersigned hereby declares that the Product identified above by manufacturer's name and model number is (one of) the product(s) specified and is suitable for the intended use as defined within the Contract Documents and has been provided and placed in operational condition by a manufacturer's authorized installer and in accordance with the manufacturer's published instructions and the Contract Documents.

SUPPLIER:

\_\_\_\_\_  
(Contact name of supplier offering above product)

Phone Number: (    ) \_\_\_\_\_

\_\_\_\_\_  
(Supplier name and address)

SUBCONTRACTOR (MANUFACTURER'S AUTHORIZED INSTALLER):

\_\_\_\_\_  
(Contact name of subcontractor installing above product)

Phone Number: (    ) \_\_\_\_\_

\_\_\_\_\_  
(Subcontractor name and address)

PRIME CONTRACTOR:

\_\_\_\_\_

**Construction Specification**

**PROJECT CLOSEOUT**

(Contact name of Contractor)

(Contractor signature and Title of Signatory)

**Contractor's Letter of Conformance****Division 15 – Fire Protection**

Project Location: \_\_\_\_\_

Date: \_\_\_\_\_

City: \_\_\_\_\_

State: \_\_\_\_\_

Project Number: \_\_\_\_\_

Store Number: \_\_\_\_\_

The following equipment / product has been inspected and approved:

- |   |                              |
|---|------------------------------|
| ▪ Swing Check Valve                     | Product Mfg and Model: _____ |
| ▪ O.S. & Y. Gate Valve                  | Product Mfg and Model: _____ |
| ▪ Tamper Switches                       | Product Mfg and Model: _____ |
| ▪ Flow Switches                         | Product Mfg and Model: _____ |
| ▪ Fire Sprinkler System Air Compressors | Product Mfg and Model: _____ |
| ▪ Fire Pump Manual                      | Product Mfg and Model: _____ |
| ▪ Fire Pump Data                        | Product Mfg and Model: _____ |
| ▪ Fire Pump Tests Results               | Product Mfg and Model: _____ |
| ▪ Jockey Pump                           | Product Mfg and Model: _____ |
| ▪ Controllers Manual                    | Product Mfg and Model: _____ |

## Statement of Conformance:

The undersigned hereby declares that the Product identified above by manufacturer's name and model number is (one of) the product(s) specified and is suitable for the intended use as defined within the Contract Documents and has been provided and placed in operational condition by a manufacturer's authorized installer and in accordance with the manufacturer's published instructions and the Contract Documents.

## SUPPLIER:

\_\_\_\_\_  
(Contact name of supplier offering above product)

Phone Number: (    ) \_\_\_\_\_

\_\_\_\_\_  
(Supplier name and address)

## SUBCONTRACTOR (MANUFACTURER'S AUTHORIZED INSTALLER):

\_\_\_\_\_  
(Contact name of subcontractor installing above product)

Phone Number: (    ) \_\_\_\_\_

\_\_\_\_\_  
(Subcontractor name and address)

## PRIME CONTRACTOR:

\_\_\_\_\_

(Contact name of Contractor)

(Contractor signature and Title of Signatory)

**Contractor's Letter of Conformance****Division 16 - Electrical**

Project Location: \_\_\_\_\_

Date: \_\_\_\_\_

City: \_\_\_\_\_

State: \_\_\_\_\_

Project Number: \_\_\_\_\_

Store Number: \_\_\_\_\_

The following equipment / product has been inspected and approved:

- |  |                              |
|--|------------------------------|
| ▪ Generator(w/maintenance Start-Up Procedures) | Product Mfg and Model: _____ |
| ▪ Battery Charger                              | Product Mfg and Model: _____ |
| ▪ Transfer Switches                            | Product Mfg and Model: _____ |
| ▪ Paddle Fans                                  | Product Mfg and Model: _____ |
| ▪ Heat Trace                                   | Product Mfg and Model: _____ |

## Statement of Conformance:

The undersigned hereby declares that the Product identified above by manufacturer's name and model number is (one of) the product(s) specified and is suitable for the intended use as defined within the Contract Documents and has been provided and placed in operational condition by a manufacturer's authorized installer and in accordance with the manufacturer's published instructions and the Contract Documents.

## SUPPLIER:

\_\_\_\_\_  
(Contact name of supplier offering above product)

Phone Number: (    ) \_\_\_\_\_

\_\_\_\_\_  
(Supplier name and address)

## SUBCONTRACTOR (MANUFACTURER'S AUTHORIZED INSTALLER):

\_\_\_\_\_  
(Contact name of subcontractor installing above product)

Phone Number: (    ) \_\_\_\_\_

\_\_\_\_\_  
(Subcontractor name and address)

## PRIME CONTRACTOR:

\_\_\_\_\_  
(Contact name of Contractor)

\_\_\_\_\_  
(Contractor signature and Title of Signatory)

**Contractor's Letter of Conformance****Division 16 – Special Systems**

Project Location: \_\_\_\_\_

Date: \_\_\_\_\_

City: \_\_\_\_\_

State: \_\_\_\_\_

Project Number: \_\_\_\_\_

Store Number: \_\_\_\_\_

The following equipment / product has been inspected and approved:

- Fire Alarm Systems Operation      Product Mfg and Model: \_\_\_\_\_
- Security Alarm Systems Operation      Product Mfg and Model: \_\_\_\_\_

## Statement of Conformance:

The undersigned hereby declares that the Product identified above by manufacturer's name and model number is (one of) the product(s) specified and is suitable for the intended use as defined within the Contract Documents and has been provided and placed in operational condition by a manufacturer's authorized installer and in accordance with the manufacturer's published instructions and the Contract Documents.

## SUPPLIER:

\_\_\_\_\_  
(Contact name of supplier offering above product)

Phone Number: (    ) \_\_\_\_\_

\_\_\_\_\_  
(Supplier name and address)

## SUBCONTRACTOR (MANUFACTURER'S AUTHORIZED INSTALLER):

\_\_\_\_\_  
(Contact name of subcontractor installing above product)

Phone Number: (    ) \_\_\_\_\_

\_\_\_\_\_  
(Subcontractor name and address)

## PRIME CONTRACTOR:

\_\_\_\_\_  
(Contact name of Contractor)

\_\_\_\_\_  
(Contractor signature and Title of Signatory)

**Construction Specification****OPERATIONS AND MAINTENANCE DATA****PART 1 - GENERAL****1.01 DESCRIPTION**

- A. The types of operations and maintenance data requirements specified in this section include submittals, and equipment check out and demonstration, and related items. Individual requirements for specific equipment and systems are specified in the applicable sections for each unit of work. Refer to other Division 1 sections and other Contract Documents for requirements of administrative submittals.

**1.02 SUBMITTALS**

- A. Prior to date of close out or grand opening, submit to the Architect of Record one final copy of maintenance manuals, present full details for care and maintenance of all visible surfaces and equipment of every nature.
- B. Bind all instruction books with hard durable covers supplied by the manufacturer, or 3-ring binders with vinyl covers furnished by the Contractor.
1. Contents shall be prepared by the manufacturer and show names, address, and phone number of the nearest service facility authorized by the manufacturer and shall include illustrations, diagrams, instructions for installation, start-up, operation, inspection, maintenance, parts lists and data sheets.
  2. Complete electrical, schematic and connection diagrams shall be provided for each equipment item.
  3. Contents shall also include the name, address and phone number of Contractor and/or Subcontractor who furnished and/or installed equipment and systems. Shall also include the name(s) and phone numbers of representatives of the Contractor to be contacted in the event of Emergency Situation. As defined in the General Conditions.
  4. All of said manuals, instruction books, diagrams, etc., shall be arranged in the order and manner with proper section dividers, to be prescribed by the Owner before time for submittal.
  5. In each book the correct model number and data for the model number shall be checked off neatly in ink where the literature covers more than one model.
    - a. In those instances where the equipment or its mode of control, or both, is job-assembled by a subcontractor for special functions, then that subcontractor shall prepare and provide written operating and maintenance instructions.
  6. Should Architect of Record indicate the submitted binder is incomplete, Contractor shall resubmit one updated bound copy complete with all required catalogs, illustrations, instructions, diagrams, and other printed materials necessary.

**1.03 TEST**

- A. Equipment companies shall check out and demonstrate their equipment including field tests which shall be witnessed by representatives of the Architect of Record, and the designated employees of the Owner and shall be performed prior to final completion as soon as reasonably possible after substantial completion.
- B. This includes, but shall not be limited to, all equipment specified, under Divisions and equipment so indicated on the Drawings.

**PART 2 - PRODUCTS**

NOT APPLICABLE

**PART 3 - EXECUTION**

NOT APPLICABLE

END OF SECTION



**Construction Specification****ABBREVIATIONS AND DEFINITIONS****PART I - GENERAL****1.01 ABBREVIATIONS**

A. A number of abbreviations is used in these construction documents, including but not limited to the following:

&	and	D.I.	ductile iron
L	angle	DIA.	diameter
@	at	DIAG.	diagonal
[	channel	DIM.	dimension
φ	diameter or round	DIV.	division
°	degree	DK.	dark
°C	degrees Celsius	DN.	down
°F	degrees Fahrenheit	D.S.	downspout
(E)	existing	D.S.P.	dry standpipe
(N)	new	DTL.	detail
#	pound; number	DWG.	drawing
AC	asphaltic concrete	E	east
A/C	air conditioning	EA.	each
ACOUS.	acoustic	E.C.	electrical contractor
ADJ.	adjustable	E.D.F.	electric drinking fountain
A.D.	area drain	E.F.	each face
AGGR.	aggregate	E.J.	expansion joint
A.B.	anchor bolt	EL.	elevation
A.F.F.	above finish floor	ELEV.	elevation
AFG	above finish grade	ELEC.	electric; electrical
AL	aluminum	EM.	emergency
ALT.	alternate	E.M.S.	energy management system
A.P.	access panel	ENCL.	enclosure
ANOD.	anodize	EQ.	equal
APPROX.	approximate	EQPT.	equipment
ARCH.	architect; architectural	E.S.	each side
BD.	board	E.W.	each way
BETW.	between	E.W.C.	electric water cooler
B.F.D.	building fire department	EXP.	expansion
BITUM.	bituminous	EXST.	existing
BLDG.	building	EXT.	exterior; external
BLKG.	blocking	F.B.O.	furnished by owner
BOT.	bottom	F.D.	floor drain
B.S.	both sides	FDN.	foundation
B.U.R.	built up roofing	FIN.	finish
CAB.	cabinet	FL.	floor
CATV	cable television	FLUOR.	fluorescent
C.B.	catch basin	F.O.C.	face of concrete
CER.	ceramic	F.O.F.	face of finish
C.I.	cast iron	F.O.M.	face of masonry
C.I.P.	cast in place	F.O.S.	face of stud
C.J.	control joint or construction joint	F.R.P.	fiber reinforced panel
CLG.	ceiling	FT.	foot; feet
cm	centimeter	FTG.	footing
CMU	concrete masonry unit	FURR.	furring
CNTR.	center	g	gram
COL.	column	GA.	gauge
CONC.	concrete	GALV.	galvanized
CONN.	connection	G.B.	grade beam; grab bar
CONSTR.	construction	GC	general contractor
CONT.	continuous	GC	garden center
CORR.	corrugated; corridor	GFI	ground fault current interrupter
CSMT.	casement	G.I.	galvanized iron
CTR.	center	GL.	glass; glazing
db	decibel	GND.	ground
DB	design bulletin	GRD.	grade
DBL.	double	G.W.B.	gypsum wall board
DEPT.	department	GYP.	gypsum
DET.	detail	H.B.	hose bibb
D.F.	drinking fountain	H.C.	hollow core

**Construction Specification****ABBREVIATIONS AND DEFINITIONS**

HD	heavy duty	PR.	pair
HPS	high pressure sodium	PSI	pounds per square inch
HT.	height	PT.	point
H.M.	hollow metal	P.T.	pressure treated
HORIZ.	horizontal		
H.P.	high point	QTY.	quantity
HPA	house plant area		
HPE	house plant enclosure	RAD.	radius
HR.	hour	R.D.	roof drain
H.W.H.	hot water heater	REF.	refer; reference
		REINF.	reinforce/ing/ment
I.D.	inside diameter	REQD.	required
IN	inches	RESIL.	resilient
INC	Incorporated	R.F.I.	request for information
INSUL.	insulate; insulation	RM.	room
INT.	interior; internal	R.O.	rough opening
INV.	invert	R.W.L.	rain water leader
ITC	Independent Testing Consultant		
		S	south; second
JAN.	janitor	SAN.	sanitary
JBE	joist bearing elevation	S.C.	solid core
JT.	joint	SCHED.	schedule
		SECT.	section
KSF	kips per square feet	S.F.	square foot; square feet
		SHT.	sheet
LAB.	laboratory	SHTG.	sheathing
LAM.	laminated	SIM.	similar
LAV.	lavatory	S.N.	solid neutral
L.B.	lag bolt	SPEC.	specification
LG.	long	SPKLR.	sprinkler
LPG	liquefied petroleum gas	S.P.P.	special purchase program
LPS	low pressure sodium	SQ.	square
		S.S.	stainless steel
m	meter; metre	STA.	station
MASY.	masonry	STD.	standard
MAT.	material	STL.	steel
MAX.	maximum	STOR.	storage
M.B.	machine bolt	STRUCT.	structural
MECH.	mechanical	SUSP.	suspend; suspended
MED.	medium		
MFR.	manufacturer	TEMP	temperature
MIN	minimum; minute	T&G	tongue and groove
MH	manhole; metal halide	THK.	thick; thickness
MIN.	minimum	THRESH.	threshold
MISC.	miscellaneous	T.O.	top of
M.O.	masonry opening	T.O.B.	top of beam
MOD.	modular	T.O.C.	top of curb
MTL.	metal	T.O.G.	top of grade
MUL.	mullion	T.O.J.	top of joist
MV	mercury vapor	T.O.L.	top of ledger
		T.O.P.	top of pavement
N/A	not applicable	T.O.S.	top of slab
N.I.C.	not in contract	T.O.S.	top of steel
No.	number	T.O.W.	top of wall
NOM.	nominal	T.R.C.	tool rental center
N.S.	near side	TV.	television
N.T.S	not to scale	TYP.	typical
		UNO	unless noted otherwise
O.A.	overall		
O.C.	on center	v	volt(s)
O.D.	outside diameter; overflow drain	VERT.	vertical
OFF.	office	VEST.	vestibule
O.H.	opposite hand; overhead		
OPP	opposite	W	west
OPNG.	opening	W/	with
OPT.	optional	WC.	water closet
		WD.	wood
PRCST.	precast	WIN.	window
P.LAM.	plastic laminate	W/O	without
PLAS.	plastic; plaster	W.P.	weatherproof
PLYWD.	plywood		

**Construction Specification****ABBREVIATIONS AND DEFINITIONS**

W.R. water resistant  
WT. weight

W.W.F. welded wire fabric  
W.W.M. woven wire mesh

**1.02 DEFINITIONS**

A. A number of definitions is used in these construction documents, including but not limited to the following:

1. Architect of Record: The Architect of Record for the Project.
2. Authority Having Jurisdiction: Any and all agencies and organizations having specific jurisdiction over the work, various components thereof, or the site on which the work is located.
3. Contractor: The primary or General Contractor for the Project in conjunction with his Subcontractors, Sub-subcontractors and Suppliers.
4. Drawings and Specifications: The Contract Documents, including all Divisions, Sections, and Addenda.
5. Engineer: The Geotechnical, Civil, Structural, Mechanical, Electrical and/or Fire Protection Engineer, etc., of Record.
6. Equal, Equivalent: Possessing the same performance qualities and characteristics; capable of fulfilling the GA 30329. utilitarian function without any decrease in quality, durability or longevity.
7. Furnish: Purchase and deliver to the contractor at the job site including permits, royalties, fees, accessories, and other items necessary for a complete installation, freight, unloading and storage, unless noted otherwise.
8. Install: Place into service in the work as specified including connections, terminations, painting, touch-up and clean-up, testing, adjusting, balancing, and remedial work, unless noted otherwise.
9. Owner: The Owner of the Job Site on which the Project is located, or in the case of lease and build-to-suit projects the primary tenant of the Project, specifically Home Depot U.S.A., Inc.
10. Provide: **Furnish equipment and material and install labor and tools.** **Furnish and install equipment and material including required labor and tools.**

**1.03 AGENCIES AND ASSOCIATIONS**

A. A number of agencies and associations is referenced in these construction documents, including but not limited to the following:

ACI: American Concrete Institute, Box 19150, Redford Station, Detroit, MI 48219.  
 AISC: American Institute of Steel Construction, Inc., 400 North Michigan Avenue, Chicago, IL 60611.  
 ANSI: American National Standards Institute, 1430 Broadway, New York, NY 10018.  
 ASHRAE: American Society of Heating, Refrigeration and Air-Conditioning Engineers, 1791 Tullie Circle N.E., Atlanta, GA 30329.  
 ASTM: American Society for Testing and Materials, 1916 Race Street, Philadelphia PA 19103.  
 CGA: Canadian Gas Association, 55 Scarsdale Road, Don Mills, Ontario, Canada M3B 2R3.  
 CGSB: Canadian General Standards Board, Ottawa, Ontario, Canada K1A 1G6.  
 CLA: Canadian Lumberman's Association, 27 Goulburn Avenue, Ottawa, Ontario, Canada K1N 8C7.  
 CSA: Canadian Standards Association, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3.  
 FM: Factory Mutual Engineering and Research, 1151 Boston-Providence Turnpike, Norwood, MA 02062.  
 HI: Hydronics Institute, 35 Russo Place, Berkeley Heights, NJ 07922.  
 HRAI: Heating, Refrigerating and Air Conditioning Institute of Canada, 5468 Dundas Street West, Islington, Ontario, Canada M9B 6E3.  
 ICBO: International Congress of Building Officials, 5360 South Workman Mill Road, Whittier, CA 90601.  
 IES: Illuminating Engineering Society of North America, 345 East 47th Street, New York, NY 10017.  
 NBC: National Building Code of Canada (National Research Council of Canada), Ottawa, Ontario, Canada K1A 0R6.  
 NFPA: National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.  
 NLGA: National Lumber Grades Authority, 1460-1055 West Hastings Street, Vancouver, British Columbia, Canada V6E 2G8.  
 SJI: Steel Joist Institute, 3127 10<sup>th</sup> Ave. North Ext., Myrtle Beach, SC 29577-6760.  
 SMACNA: Sheet Metal and Air Conditioning Contractors National Association Inc., 4201 Lafayette Center Drive, Chantilly, VA 20151-1209.  
 UL: Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062.  
 ULC: Underwriters Laboratories of Canada, 7 Crouse Road, Scarborough, Ontario, Canada M1R 3A9.  
 WCLB: West Coast Lumber Inspection Bureau, Southwest Varns Street, Portland, OR 97223.  
 WWP: Western Wood Products Association, 1500 Yeon Building, Portland, OR 97204.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

DIVISION 02000 - SITE WORK

THIS DIVISION 02000 HAS BEEN DEVELOPED BY  
AND IS THE RESPONSIBILITY OF:  
KIMLEY HORN ASSOCIATES

ALL INQUIRIES REGARDING SITE WORK, INCLUDING RELATED  
SITE FEATURES, SHALL BE DIRECTED TO:

ALL SHOP DRAWINGS AND SUBMITTAL DATA RELATED  
TO THE SITE WORK SHALL BE SENT DIRECTLY TO:

**PART 1 - GENERAL****1.01 DESCRIPTION OF WORK**

- A. This Section and related drawings describe requirements pertaining to earthwork.
- B. The soils reports, boring logs, supplemental reports, letters etc. are included in these specifications and hereby made a part of these specifications. The project shall be constructed in accordance with the recommendations contained in these reports.
- C. The work includes, but is not limited to:
  - 1. Site clearing and removal of all existing construction.
  - 2. Earth moving and excavation including:
    - a. Excavation and haul off site of all unsatisfactory materials identified in the Geotechnical Report.
    - b. All stockpiling, placement, removal, re-stocking, etc. of all soil materials.
    - c. Installation of all subgrade drainage systems.
    - d. Excavation and undercut to produce designated lines and grades and reuse on site of suitable materials.
    - e. Import and place fill materials as may be required to produce designated lines and grades of fills, backfills and rough grades.
    - f. Dewatering all trenches and excavations.
    - g. Trench Rock Removal and reuse on site (if allowed by geotech report)
    - h. Mass Rock Removal and reuse on site (if allowed by geotech report)
    - i. Installation of Geotechnical fabric.
    - j. Proof rolling and compacting subgrade soils and fill.
    - k. Monitoring of the consolidation of underlying soils after new fill has been placed. This includes the installation of settlement plates, settlement pins, etc. The Geotechnical Engineer shall determine when settlement has become substantially complete.
    - l. Utility trenching work within the building areas and extending 5' -0" beyond perimeter walls.
    - m. Sheet piling, shoring and other protection, as required, to complete the work of this section.
    - n. Protection of existing site features and adjacent properties during the course of the work.
    - o. Preparation of Building pad. Building Pad: Shall mean that portion of the site upon which the store is constructed and includes, without limitation, the "footprint" of the store building and Garden Center and a minimum of five feet (5') beyond such "footprint", as well as the area to be occupied by vestibules, the building apron, lumber canopy and drive-thru, rear lumber area, material storage areas, utility pads, stairs, ramps, stoops and loading pads, to the extent the same lie beyond said five foot (5') strip.
- D. Related work specified elsewhere:
  - 1. Section 01000 - Special Conditions
  - 2. Section 01411 - Testing and Inspection

**1.02 Unit Prices: See Bid Proposal Form for required unit price breakdown.**

ADD ADDITIONAL ITEMS AS REQUIRED

**1.03 SITE INFORMATION TECHNOLOGY**

- A. The soils report on indicated subsurface conditions is not intended as a representation or warranty of the continuity of such conditions. It is expressly understood that the Owner will not be responsible for interpretations or conclusions drawn therefrom by the Contractor. The data is included as an appendix to these Specifications for the convenience of the Contractor.
- B. Additional soil investigations may be made by the Contractor at no cost to the Owner provided such operations are acceptable and approved in writing by the Owner's Representative.

**1.04 QUALITY ASSURANCE**

- A. It shall be the responsibility of the Contractor to perform all earthwork in accordance with the Geotechnical Engineering Report, contract drawings, and specifications.
- B. The Owner will employ and pay for the services of an Independent Testing Contractor (ITC) to provide testing and inspections of the earthwork
- C. The services of the ITC, and the information provided by the ITC, are provided for the sole benefit of the Owner. The information is provided to Contractor only so Contractor is aware of what is being reported to Owner. The Contractor shall not, and is not entitled to, rely upon any information provided by the ITC in any manner. Contractor is solely responsible for assuring that the Work complies with the Contract Documents in all respects and may not rely on the ITC for this, or any other, assurance. The ITC and its representatives are not authorized to revoke, alter, relax, enlarge or release any

requirements of the Contract Documents, approve or accept any portion of the Work, perform or excuse any duties of the Contractor, or be a party to the scheduling of the Work. The ITC is not an authorized agent of the Owner with respect to the relationship between Owner and Contractor.

- D. Earthwork materials and operations shall be tested and inspected as the work progresses. Failure by the ITC to detect any defective work or material shall not in any way prevent later rejection (when such defect is discovered) nor shall it obligate the Owner for final acceptance.
- E. When tests indicate compaction does not meet requirements, fill and backfill shall be dried out or moistened as necessary, scarified, and re-compacted or removed and replaced with acceptable fill-material. Re-compacted areas shall be retested. This procedure shall be repeated until tests indicate compliance with specified requirements. Reworking and retesting shall be provided at no cost to the Owner. Cost of retesting shall be withheld from Contractor's retainage.
- F. See Section 01411 Testing and Inspection for a more thorough description of the testing and inspections to be performed and the Contractor's responsibilities to facilitate that work.
- G. Layout of work: Contractor to provide all surveying and layout services. All work shall be carefully laid out and under the supervision of a registered land surveyor in the project's state.

#### 1.05 SUBMITTALS TO CONTRACTOR

- A. A letter from a Registered Surveyor certifying the foundation location and bottom of footing matches the contract document location and elevations.

#### 1.06 GENERAL EARTHWORK REQUIREMENTS

- A. All work shall be executed in accordance with the contract documents. Any conflict shall be brought to the attention of the Architect, who shall decide the controlling specification.

#### 1.07 COMPACTION EQUIPMENT

- A. The Contractor shall use whatever equipment is capable and required to attain the desired results in an acceptable manner and time frame.

#### 1.08 FOUNDATION INSPECTION

- A. After excavations for footings are completed to required depths, the ITC shall verify the bearing capacity.
- B. Contractor shall make arrangements for and provide required temporary access routes to locations to be inspected, and shall fill test holes with cement and sand grout at no expense to Owner when required.

#### 1.09 SITE CONDITIONS

- A. Existing Utilities: The Contractor shall verify the location of any existing underground utilities in the areas of work. If utilities are to remain in-place, provided adequate means of support and protection during earthwork operations.
  - 1. Should uncharted or incorrectly charted piping or other utilities be encountered during excavation, consult the utility owner and Architect immediately for directions. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to the satisfaction of the utility owner.
  - 2. If water, gas pipes, conduits or other utilities become broken in the process of the work, the Contractor should give immediate notice to the proper authorities and shall be responsible for all damage to persons or properties caused by such breaks. Failure to give prompt notice to authorities shall make the contractor responsible for all losses of water or gas, and responsible for any interruption of services.
  - 3. The use of explosives is not permitted unless specifically recommended by Geotechnical Engineer and authorized by the Owner. Contractor shall be responsible for obtaining all required permits and/or approvals for regulatory agencies.

### PART 2 - PRODUCTS

#### 2.01 SATISFACTORY SOIL MATERIALS

- A. Satisfactory soil materials shall be in accordance with the recommendations of the soils report and the requirements of the Geotechnical Engineer. Fly ash shall not be used as a soil material in the preparation of the building pad (subgrade or subbase).

#### 2.02 FILL MATERIALS

- A. Excavated material that is suitable as defined in the Geotechnical report may be used for fills and backfills. Provide any additional fill material from off the site as may be required to produce designated lines and grades of fills, backfills and rough grades. Fills brought from off the site shall be tested for compliance with the specifications for various uses as specified. All fill and topsoil materials brought from offsite shall be free of hazardous contaminants as defined by State and Federal requirements.
- B. Fill materials shall be approved by the soils testing laboratory and conform to the following requirements, except as specifically indicated otherwise.
  - 1. Fill shall be earth, free of debris, cinders, combustibles, roots, sod, wood, cellulose, organic materials, and materials that may be subject to termite attack and as indicated in the soils report.
  - 2. Top 18" of fills under topsoil of lawn and planted areas shall be earth, free of debris, cinders, sod, wood and roots over 1/4" in diameter. Fill shall be free of any toxic materials that will interfere with plant root development.
  - 3. Fill, within ten feet from buildings and other structures, shall be soil free of debris, cinders, combustibles, roots, sod, wood, cellulose, and organic materials and as indicated in the soils report.
  - 4. All fill to replace excess excavation under footings and foundations shall be in accordance with the requirements of the soils report and the recommendations of the Geotechnical Engineer.
  - 5. Topsoil: Relatively free of decomposed organic material, including roots, sticks, leaves, paper and other undesirable trash (glass, plastic or metal fragments) that could interfere with soil drainage and plant growth. Topsoil shall be free of any toxic materials that will interfere with plant root development.

### 2.03 GEOSYNTHETICS

- A. Geotextile Drainage Fabric: Mirafi 140N or approved equivalent.
- B. Geotextile Stabilization Fabric: Mirafi HP370 or HP570 or approved equivalent.
- C. Geogrid Base Reinforcement Mirafi BasXgrid 11 or BasXgrid 12 or approved equivalent.
- D. Geogrid Wall/Slope Reinforcement: Miragrid XT Series or approved equivalent.

## PART 3 - EXECUTION

### 3.01 SURFACE PREPARATION

- A. Surface preparation shall be performed in accordance with the soils report and the requirements of the Geotechnical Engineer.
- B. All building, pavement, and walkway areas shall be stripped of all topsoil, plant growth, or organics prior to the commencement of excavation. A sufficient quantity of topsoil shall be stockpiled on-site to complete the necessary landscape operations. The topsoil shall be free of roots, stumps, debris, or other deleterious materials, and as specified in Fine Grading. Excess topsoil may be utilized as general fill in landscaped areas, or should be disposed of or stockpiled, as directed by the Owner.
- C. Perform earthwork and site grading in a manner to prevent surface water and subsurface or groundwater from flowing into excavations, and to prevent water and sedimentation from flooding the project site and surrounding area.
- D. Provide temporary ditches, pumps, sedimentation basins and other diversions etc., as required to maintain cut areas and convey the water away from the site. Direct stormwater away from deep fill areas. Maintain until no longer required, and then backfill to specified compaction and fill matching required new or original grades. Immediately prior to placing of other work, recheck base, fill voids and if necessary reroll to required density and compaction. Do not use trench excavations for site utilities as temporary drainage ditches.
- E. Remove all water from excavations using dewatering methods, which will prevent softening of foundation bottoms, undercutting footings, and soil changes detrimental to the stability of subgrades and foundations. Soils which are deemed suitable by classification and which are excessively moist due to lack of dewatering or surface water control will be the responsibility of the contractor for removal and replacement.
- F. The building pad shall be constructed in such a manner as to provide positive drainage of surface water off the pad and to protect the pad surface and subgrade. Temporary ditches shall be constructed to carry any surface run off away from the pad area, as directed by the Geotechnical Engineer. At start of building construction, the pad shall be prepared for foundations and all temporary ditches properly backfilled.
- G. The Contractor shall install all subsurface drainage dewatering measures as indicated on the construction documents and as directed by the Geotechnical Engineer.

### 3.02 EXCAVATION

- A. General: Earth Excavation consists of removal and disposal of pavements and other obstructions visible on the ground surface, material of any classification indicated in the data on subsurface conditions and all material encountered when establishing required finished grade elevations as shown on the design plans.
- B. Excavate cut areas within confines of site to required grades, levels, contours, and to sufficient depth necessary to obtain specified density when rolled and, in any case, to depth required to allow for materials that are to be placed. When cut is complete, before placing to cover materials, compact in accordance with the soils report and the requirements of the Geotechnical Engineer.
- C. Unauthorized Excavation: Consists of removal of materials beyond indicated subgrade elevation not required by the Contract Documents. Unauthorized excavation, as well as remedial work directed by Owner, shall be at the Contractor's expense.
  - 1. Under footings, foundations, retaining walls, etc., fill unauthorized excavation by extending indicated bottom elevation of footing, etc. to the excavation, without altering the required top elevation. Lean concrete fill shall be used to bring elevation to proper level, as deemed acceptable by the Geotechnical Engineer.
  - 2. Elsewhere, backfill and compact unauthorized excavations as specified for authorized excavation of same classification, unless otherwise directed by Owner.
- D. If ground water is discovered to exist within 12" below the bottom of the lowest floor slab, the Contractor shall notify the Geotechnical Engineer who will determine if the underground structure and drainage as designed are adequate.

### 3.03 REMOVAL OF UNSUITABLE SOIL MATERIALS AND MEASUREMENT OF IMPORT

- A. Additional Excavation: When excavation has reached required elevations, notify Geotechnical Engineer who will observe subgrade condition. If unsuitable materials are encountered at required elevations, excavation shall proceed until suitable materials are encountered, and excavation shall be backfilled with soils of same classification, as directed by Geotechnical Engineer.
- B. Where the removal of unsuitable soil materials is due to the fault or negligence of the Contractor in his performance of earthwork and site grading operations, excavate the resulting unsatisfactory soil material and replace with compacted satisfactory soil material as required and as determined by the Geotechnical Engineer at no additional cost to the owner.
- C. Over excavation below required elevations and corrective fill materials shall be at the contractor's expense.

### 3.04 FILL AND BACKFILL

- A. Notification of Geotechnical Engineer: The Geotechnical Engineer shall be notified 48 hours prior to any fill, backfill, or compaction operations.
  - 1. Permit Geotechnical Engineer to observe all subgrades for each layer of fill or backfill. Additional fill or backfill should not be placed unless Geotechnical Engineer has approved the subgrade and/or previous layer of fill.
  - 2. When required by the Geotechnical Engineer, the Contractor shall certify the field elevations of the compacted subgrade or fill layer.
  - 3. If based on the Geotechnical Engineer's reports and inspections, subgrade or fill which has been placed is below specified density for respective construction areas, provide additional compaction at no additional expense to Owner.
- B. Provide the required minimum density and moisture content of compacted fill in accordance with the soils report and the requirements of Geotechnical Engineer.
- C. When temporary sheeting, shoring or bracing is removed, fill remaining voids with backfill material and compact to required density.
- D. Fill shall be placed in lifts in accordance with the soils report. Fill settlement shall be monitored with settlement plates to be installed with new fill, in accordance with the recommendations of the soils report and the requirements of the Geotechnical Engineer. Settlement plates shall be located in accordance with the soils report. Construction of building, site utilities, pavement and other site amenities may proceed once settlements have been essentially completed. Geotechnical Engineer shall determine when satisfactory settlements have occurred.
- E. Redress and recompact any areas that settle below required grades before execution of other work required and leave solid and secure against future settlement.
- F. All existing slope faces require benching and inspection prior to adjacent fill placement.
- G. Subgrades, structural and granular fills and compaction requirements shall extend beyond the outer edge of site improvements as follows. In areas of overlapping requirements, the more restrictive compaction and fill requirements shall govern.
  - 1. Buildings: 5 feet



2. Paving: 5 feet

- H. Sidewalks and truck wells shall be considered pavement areas in addition to parking stalls and drive aisles.

### 3.05 MOISTURE CONTROL

- A. Provide sufficient equipment capable of adding measured amounts of moisture to the soil material as determined by moisture-density relation tests. Maintain the actual moisture content in the soil material at the time of compaction to within the limits specified for satisfactory soil materials.
- B. Where the subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply the required amount of water to the surface of subgrade, or layer of soil material, in such manner as to prevent free water appearing on the surface during or subsequent to compaction operations.
- C. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified percentage of maximum density.
- D. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread on the surface where directed and permitted to dry. Assist drying by discing, harrowing or pulverizing, until the moisture content is reduced to a satisfactory value, as determined by moisture-density relation tests. When accepted by the Geotechnical Engineer, the soil material may be used in compacted backfill or fill.

### 3.06 GRADING

- A. The subgrade for lawn and planting areas shall be not less than 6" inches below final finish grade.
- B. The subgrade for paved areas shall be finished to elevations and compacted to density required by Geotechnical Report to allow for sub-base and finished paving.
- C. Grading, including excavated and filled sections and adjacent transition areas, shall be reasonably smooth, compacted and free from irregular surface changes. Degree of finish shall be that ordinarily obtainable from either blade grader or scraper operations, except as otherwise specified. Tolerance for areas within 10 feet of buildings and all areas to be paved shall not exceed 0.10 feet above or below established subgrade. All ditch swales and gutters shall be finished to drain readily. Unless otherwise indicated on drawings, subgrade shall be evenly sloped to provide drainage away from building walls in all directions at a grade not less than 1/4" per foot. Provide roundings at top and bottom of banks and at other breaks in grade.
- D. Redress and recompact any areas that settle below required grades because of traffic, precipitation, or storage loading before execution of other work required.
- E. The finished grades may be adjusted to yield a "balanced" site. All adjusted grades must be approved by the Civil Engineer and documented by as-built survey by the Contractor.
- F. The General Contractor is responsible for achieving final grades on site.

### 3.07 PROOFROLLING

- A. Exposed subgrade in the building area and in the paved areas shall be proofrolled to detect soft or unsuitable soil conditions if required by the Geotechnical Report and/or by the Geotechnical Engineer.
- B. Proofrolling shall be done after a suitable period of dry weather to avoid degrading an otherwise acceptable subgrade.
- C. Proofrolling shall be performed with a fully loaded 12 cubic yard tandem axle dump truck or similar vehicle as per the Geotechnical Report recommendations or Geotechnical Engineer's recommendation in the field. Geotechnical Engineer's recommendation in the field governs. The vehicle shall make a minimum of four overlapping passes with the latter two passes at right angles to previous passes.
- D. Soft, organic, highly plastic, or excessively wet soils or old fill materials encountered during the proofrolling operation, causing deflection exceeding 1/2" inch or not acceptable by the Geotechnical Engineer, shall be excavated and replaced with clean fill or material specified by the Geotechnical Engineer in the field to facilitate compaction at no extra cost under the base contract.

### 3.08 MATERIAL STORAGE

- A. Stockpile excavated materials classified as satisfactory soil material where directed, until required for fill. Place, grade and shape stockpiles for proper drainage. Stockpiles shall be compacted to at least 90 percent of the soil's standard proctor maximum dry density or as directed by the Geotechnical Engineer to minimize water infiltration.

- B. Dispose of excess soil material and waste materials, such as excavated material classified as unsatisfactory soil material, trash and debris by hauling from the site.
- C. All stockpiling of materials, placement removal, re-stocking, etc. shall be performed as required and at no additional cost to the owner.

**3.09 EXCAVATION FOR DITCHES**

- A. Cut ditches to the cross-sections and grades as shown on the drawings. Deposit excavated materials a sufficient distance from the edge of ditches to prevent cave-ins or material falling or sliding into the ditch. Keep ditches free of an accumulation of leaves, sticks and other debris until final acceptance of the work. Slope sides of trenches and ditches as necessary to comply with current OSHA Regulations. Utility trenches/ditches shall not be excavated and utility lines shall not be installed until Geotechnical Engineer has determined that fill settlement (if required) is substantially complete.

END OF SECTION

**Construction Specification****MODULAR RETAINING WALL SYSTEM****PART I - GENERAL****1.01 SECTION INCLUDES**

- A. Furnishing and installing modular retaining wall units to the lines and grades designated on the construction drawings and as specified herein.
- B. Preparing foundation soil, furnishing and installing leveling pad or footing, unit fills and backfill to the lines and grades designated on the construction drawings.
- C. Furnishing and installing all appurtenant materials required for construction of the retaining wall(s) as shown on the construction drawings.
- D. Submission of the proprietary design information, engineering calculations, material lists and design certifications as required herein, on the construction drawings or in the Special Conditions to the contract.
- E. The modular retaining wall systems specified herein are both Base Bid and Alternate systems. See Alternates section and paragraph 2.01 B for description of Base Bid and Alternate systems. Base bid wall system to be as shown on the site plan drawings.

**1.02 RELATED SECTIONS**

- A. Related work specified elsewhere:  
 Section 01411 - Testing and Inspection  
 Section 02200 - Earthwork  
 Section 03300 - Cast in Place Concrete

**1.03 REFERENCE DOCUMENTS:**

- A. American Association of State Highway and Transportation Officials (AASHTO)
  - 1. AASHTO M288 Geotextile Specification for Highway Applications
  - 2. AASHTO Standard Specifications for Highway Bridges
- B. National Concrete Masonry Association (NCMA)
  - 1. NCMA Design Manual For Segmental Retaining Walls, Third Edition, Fifth Printing (2012)
  - 2. NCMA SRWU-2 Determination of Shear Strength Between Segmental Concrete Units

**1.04 REFERENCE STANDARDS**

- A. American Society for Testing and Materials (ASTM):
  - C 90 Hollow Load Bearing Masonry Units
  - C140 Sampling and Testing Concrete Masonry Units
  - C145 Solid Load Bearing Concrete Masonry Units
  - C31 Method of Making and Curing Concrete Compressive and Flexural Test Specimens in the Field
  - C33 Specification for Concrete Aggregates
  - C39 Method of Test for Compressive Strength of Molded Concrete Cylinders
  - C92 Methods of Obtaining and Testing Drilled Cores and Sawn Beams of Concrete.
  - C94 Specifications for Ready-Mixed Concrete
  - C138 Unit Weight, Yield and Air Content of Concrete
  - C143 Method of Test for Slump of Portland Cement Concrete
  - C150 Specifications for Portland Cement
  - C172 Standard Method for Sampling Fresh Concrete
  - C173 Method of Test for Air Content of Freshly Mixed Concrete by the Volumetric Method
  - C192 Method of Making and Curing Concrete Test Specimens in the Laboratory
  - C231 Method of Test for Air Content of Freshly Mixed Concrete by the Pressure Method
  - C260 Specification for Air-Entraining Admixture for Concrete
  - C309 Specification for Liquid Membrane-Forming Compounds for Curing Concrete
  - C330 Standard Specifications for light weight aggregate for Structural I Concrete
  - C494 Specification for Chemical Admixtures for Concrete
  - C1372 Minimum Requirements for SRW (Segmented Retaining Wall) Units

**1.05. SUBMITTALS TO CIVIL ENGINEER**

- A. Samples of all products used in the work of this section. If units are of such size to make submission impractical, adequate examples of finish and material shall be provided.

- B. Latest edition of manufacturer's specifications for proposed materials, and method of installation and list of materials proposed for use.
  - C. Four copies of shop drawings, signed and sealed by the retaining wall Design Engineer of Record, for all walls showing overall dimensions, reinforcing, foundations, soil reinforcement, drainage systems, backfill, appurtenances to be provided and coordination with items not provided as part of the wall system.
  - D. Submit required materials and drawings directly to the Owners Consulting Civil Engineer, within fifteen (15) days of the Contract Date, with a copy of the transmittal to the Owner's Construction department. Prior to submittal, the design shall be certified by a professional engineer registered in the state where the project is located.
  - E. The design shall incorporate factors of safety for Sliding, Bearing, Overturning, Slope Stability and Design Uncertainties as recommended in the Geotechnical Investigation unless specifically waived or modified in writing by Owner's Construction Department and the Owner's Consulting Civil Engineer.
  - F. Provide design for permanent and temporary dewatering recommendations.
  - G. Provide anticipated settlements.
- 1.06 QUALITY ASSURANCE**
- A. Any specific testing or inspection services required by the retaining wall design shall be provided by the General Contractor as noted in section 01411 Testing and Inspection.
  - B. Construction of a mockup of adequate size to illustrate the finish and construction techniques may be required, at a location acceptable to the Owner, for any wall system with which the Owner is not familiar or for which unique design modifications are proposed.

**PART 2 - PRODUCTS****2.01 MANUFACTURED UNITS**

- A. Retaining wall units, reinforcing and accessories shall be supplied as specified in the manufacturer's submissions. Units produced under a license from an approved proprietary system shall be manufactured in a facility meeting all requirements of the licensing system with adequate capacity to supply the product to the site in a timely manner. Materials shall be stored as required to prevent damage and staining.
- B. Acceptable retainage system which will be allowed based on shop drawings and calculations.
  - 1. "Keystone" Retaining Wall System (BASE BID) as manufactured by a licensed distributor for Keystone Retaining Wall Systems, Inc., Minneapolis, MN.
  - 2. Mesa Retaining Wall Block as manufactured by Tensar International, Atlanta, GA, 888-828-5126.
  - 3. Redi-Rock Retaining Wall Systems as manufactured by a licensed dealer for Redi-Rock International, Charlevoix, MI, 866-222-8400.

NOTE: Geogrids (lengths and elevations) for use with all systems shall be designed by the engineer and further specified in the approved shop drawings. Material shall be stored as required to protect from damage until used.

**2.02 LEVELING PAD**

- A. Leveling pad material shall consist of compacted sand, gravel, crushed rock or leveling concrete as shown on the construction drawings and/or shop drawings. Walls over 25' will require foundation improvement.

**2.03 FILL AND BACKFILL**

- A. Unit fill (if required) and backfill materials, shall be as specified and shown on the construction drawings and/or shop drawings.
- B. Unit weight (Typically > 100 pounds/cubic foot)
- C. Gradation (Maximum fines: 10 to 35%)
- D. Plasticity (Plasticity Index 10-19)
- E. Effective Friction Angle (Typically 28 to 30 degrees)
- F. Cohesion should not be used in the design for fill behind the wall.

**2.04 HEIGHT LIMITATIONS**

- A. The height of a modular retaining wall system shall not exceed a thirty (30) foot continuous height without a level terrace.
- B. Walls greater than thirty (30) inches in height shall be provided with fall protection safety railings and comply with federal, state and local codes.
- C. Walls adjacent to a vehicular traffic application shall be provided with guardrail to prevent vehicular traveling over the top of a wall. A guardrail or similar barrier shall also be provided to protect a wall that is closer than four (4) feet from the face of a curb barrier.
- D. Wall embedment depth to be determined by loading conditions, provide design recommendation.
- E. The design should be performed with a minimum factor of safety of 1.5 for deep-seated global stability.
- F. Any deviations beyond these requirements must be approved by Home Depot.

**PART 3 - EXECUTION****3.01 EXCAVATION**

- A. Contractor shall excavate to the lines and grades required. Over-excavation and/or recompaction shall be performed as required to produce the specified bearing conditions.

**3.02 LEVELING PADS**

- A. Leveling pads and foundations, unit installation, cap installation, installation of geogrid and/or other anchor materials and installation of accessories and appurtenances shall be carried out according to the manufacturer's recommendations and the approved drawings.

**3.03 FIELD QUALITY CONTROL**

- A. If compaction requirements, embedment of reinforcing or other conditions are not met at any time during the construction process, Contractor shall remove and reconstruct deficient areas to obtain proper conditions at no additional cost to Owner.
- B. Independent Testing Laboratory, as hired by the General Contractor, shall promptly prepare test reports and distribute to Owner, Owner's Consulting Civil Engineer and retaining wall Design Engineer of Record all testing required by the certified and approved design documents. In the event any test performed fails to meet these requirements, Owner, Owner's Consulting Civil Engineer and retaining wall Design Engineer of Record shall be notified immediately by General Contractor's Independent Testing Laboratory.
- C. Contractor shall distribute daily digital photographs showing and documenting the construction of the wall system to the Owner, Owner's Consulting Civil Engineer and retaining wall Design Engineer of Record.
- D. All costs related to retesting due to failures shall be paid for by the Contractor at no additional expense to Owner. Owner reserves the right to employ an Independent Testing Laboratory and to direct any testing that is deemed necessary.
- E. Contractor shall provide free access to site for testing activities.

**END OF SECTION**

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**Construction Specification**

Section 02282  
**TERMITE CONTROL**

**PART 1 - GENERAL****1.01 DESCRIPTION**

- A. This Section describes requirements pertaining to termite control treatment and materials.

**1.02 GUARANTEE**

- A. Termite treatment shall be fully guaranteed for a five (5) year period from date of final application and any damage during guarantee period due to termites shall be repaired and/or replaced at no cost to Owner.

**1.03 SURETY BOND**

- A. In addition to guarantee, and upon request of Owner, Contractor shall furnish Owner with a surety bond by a surety company duly authorized to operate in the State where the structures are built to ensure perpetuation of annual termite treatment service and to ensure payment for any damage up to \$250,000.00 resulting from termite action during five (5) year period.
- B. If bond is requested, costs for bond and for annual service policy will be paid by Owner in addition to costs for original construction contract.

**PART 2 - PRODUCTS****2.01 MATERIALS**

- A. One of the following chemicals shall be applied at concentration specified in the individual chemical product literature. Chemical concentration application rates shall be sufficient to provide the Owner with a five (5) year guarantee from terminate damage as specified in paragraph 1.02 above.
1. Backed by Bayer: Premise 75 WP Insecticide
  2. FMC Corporation: Transport Termiteicide
  3. Syngenta: Demon Max
- B. Any termicide used shall have the approval of the EPA, all Federal State and local governmental agencies having jurisdiction, prior to application.

**PART 3 - EXECUTION****3.01 PREPARATION**

- A. Treat earth base, after compaction, to be covered by foundations and interior concrete slabs with one of the chemicals specified herein. Chemicals shall be applied in water emulsion only.
- B. Provide warning signs displayed at approximately 50 ft. intervals around perimeter of treated areas describing the materials used and their danger to personnel. Remove signs when treated areas have been covered with permanent materials.

**3.02 APPLICATION**

- A. Apply not less than one gallon per 10 square feet as overall treatment with an additional two gallons per 5 linear feet applied to critical areas, such as along exterior foundation walls, entrances and similar locations that may be determined as likely points of entry by termites. Use a flow meter attached to applicator to measure rate of application.
- B. Termite treatment shall be applied by an experienced exterminating company, regularly engaged in the business and fully licensed.

**3.03 CLEAN UP**

- A. Remove all excess materials, rubbish and debris from site at completion of Work.

END OF SECTION

**SECTION 02370 – EROSION AND SEDIMENTATION CONTROL (INCLUDING SWPPP)****PART 1 – GENERAL****1.1 SUMMARY****1.1.1 Section Includes:**

- (a) Installation of temporary and permanent erosion and sedimentation control systems.
- (b) Installation of temporary and permanent slope protection systems.
- (c) Storm Water Pollution Prevention Plan “SWPPP”
- (d) Certification and delegation letters
- (e) Meeting outlines and sign in sheets
- (f) Required SWPPP training and certifications
- (g) Effluent and numeric nutrient limit guideline requirements

**1.1.2 Related Sections:**

- (a) Section 01411 - Testing and Inspection
- (b) Section 02051 – Building Demolition
- (c) Section 02200 – Earthwork
- (d) Section 02721 – Storm Drainage
- (e) Section 02810 – Fine Grading, Temporary Grassing and Erosion Control
- (f) Section 02920 – Soil Preparation
- (g) Section 02930 – Lawns and Sod
- (h) Section 02940 – Landscape Planting
- (i) Storm Water Pollution Plan
- (j) Construction Drawings

**1.2 ENVIRONMENTAL REQUIREMENTS**

Protect adjacent properties; any identified endangered or threatened species or critical habitat, any identified cultural or historical resources and receiving water resources from erosion and sediment damage until final stabilization.

**1.3 DEFINITIONS**

1.3.1 Task – a storm water related issue that requires action to be taken to achieve or maintain compliance with Storm Water Requirements.

1.3.2 Log of Tasks - the Log of Tasks generated by Inspection Reports submitted to EVOCO.

1.3.3 BMP – (“Best Management Practices”) – schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants in storm water to waters of the United States, as well as treatment requirements, operating procedures, and practices to control site runoff, spillage, leaks, waste disposal and/or drainage from raw material storage.

1.3.4 Commencement of Soil Disturbance Activities - the initial disturbance of soils associated with clearing, grading, or excavating activities or other construction-related activities.

1.3.5 Effluent and Numeric Nutrient Limit Guideline Requirements Testing requirements listed in SWPPP Binder Section 1. Item G that meets type, frequency and reporting of State General Permit.

- 1.3.6 EVOCO - the contractor and the system used to collect and track Inspection Reports and other storm water compliance data and to generate weekly compliance reports. Owner may designate an alternate vendor to perform this service from time to time in Owner's sole discretion.
- 1.3.7 Home Depot Inspector - shall mean a properly qualified employee of the independent testing company assigned by Owner to the Storm Water Site.
- 1.3.8 Home Depot Storm Water Manager - Unless specified otherwise by Owner, the Home Depot Project Manager (as defined in the General Conditions of the Contract for Construction (HDGENCON)) shall be the Home Depot Storm Water Manager.
- 1.3.9 Inspection Report – Report included in the EVOCO workspace to collect weekly, and rain-related inspection data.
- 1.3.10 Pre-Construction Conference Checklist – Appendix SW 2
- 1.3.11 Project Superintendent - the employee designated by the Contractor
- 1.3.12 REAP (CA only) – Rain Event Action Plan - Storm events, photographs must be taken before, during, and after storm events of 1/2 inch or more and submitted to SMARTS every three rain events by Project Superintendent. Risk Level 2 and 3 projects must develop and implement a Rain Event Action Plan (REAP) within 48 hours of a likely rain event (defined as a forecast of 50% or more probability of 0.01 inch or more of rain).
- 1.3.13 Remediate or Remediation (as the case may be) - action to achieve and maintain compliance with Storm Water Requirements.
- 1.3.14 Storm Water Coordinator - the Home Depot employee, designated under Paragraph 4 of the Consent Decree (Designation of Home Depot's Storm Water Coordinator).
- 1.3.15 Storm Water Permit - as applicable for a particular Storm Water Site: the NPDES General Permit for Storm Water Discharges From Construction Activities (as modified and effective February 16, 2012) issued by the U.S. Environmental Protection Agency ("EPA") or any subsequent re-issuance of the same, a federally issued individual permit governing storm water discharges from construction activities pursuant to 33 U.S.C. § 1342(a), or any permit governing storm water discharges from construction activities pursuant to any state law that is part of a program EPA has approved under 33 U.S.C. § 1342(b).
- 1.3.16 Storm Water Professional - an individual who has successfully completed and is certified under the training program administered by StormwaterONE (or such other vendor as Owner may designate from time to time in its sole discretion) on behalf of Owner.
- 1.3.17 Storm Water Requirements – the requirements set forth in: (i) applicable Storm Water Permits; (ii) the storm water requirements of the CWA (as defined in section 4.1.1), state statutes, and federal and state regulations that are applicable to a particular Storm Water Site.
- 1.3.18 Storm Water Site - any location in the United States for which 1) The Home Depot or a Home Depot contractor, in the construction of a Home Depot Store, a Home Depot Distribution Center, a Home Depot Transit Facility, or a Home Depot Lumber Distribution Center either: (i) has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications or (ii) has day-to-day operational control of those activities that are necessary to ensure compliance with a SWPPP for the site or other



permit conditions, and at which there is or will be disturbance of soils associated with clearing, grading, or excavating activities or other construction activities over an area greater than or equal to one acre, or the disturbance of less than one acre of total land area that is a part of a larger common plan of development or sale if the larger common plan will ultimately disturb one acre or more, or which is otherwise subject to the NPDES storm water construction regulations by virtue of the definitions set forth at 40 C.F.R. § 122.26(b)(14)(x) or 40 C.F.R. § 122.26(b)(15), or, in the alternative, by storm water construction regulations that are part of a state program EPA has approved under 33 U.S.C. § 1342(b). The term Storm Water Site shall not include joint development construction sites for which Home Depot or a Home Depot contractor does not (i) have operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications, or (ii) have day-to-day operational control of those activities at a project which are necessary to ensure compliance with a SWPPP for the site or other permit conditions.

- 1.3.19 SWPPP – (“Storm Water Pollution Prevention Plan”) – a plan for controlling pollutants in storm water and non-storm water discharges from the Storm Water Site that satisfies the Storm Water Requirements.
- 1.3.20 SWPPP Binder – a three-ring binder which shall be maintained by Contractor on the Job Site for duration of Project and which shall contain the Storm Water Permit, SWPPP, copies of inspection forms, certifications and other materials required for compliance with Storm Water Requirements and this Section 02370. Home Depot Storm Water (or an alternate vendor as Owner may appoint from time to time in Owner's sole discretion) shall provide Contractor with the initial SWPPP Binder for the Storm Water Site prior to Commencement of Soil Disturbance Activities.

## **PART 2 – PRODUCTS AND MATERIALS**

- 2.1 Seed, sod, and ground covers for the establishment of vegetation in accordance with Section 02940.
- 2.2 Sediment control devices as specified on the Drawings.
- 2.3 Rolled erosion control products according to Erosion Control Technology Council (ECTC) standard specifications.
- 2.4 Temporary mulches such as loose straw, wood cellulose, or agricultural silage.
- 2.5 Rip-Rap as specified in Section 02200
- 2.6 Temporary and permanent outfall structures as specified on the drawings.

## **PART 3 – GENERAL GUIDELINES REGARDING PREPARATION AND EXECUTION**

- 3.1 PREPARATION
  - 3.1.2 Contractor shall execute the Storm Water Pollution Prevention Plan Certification in the form of Appendix SW 6 and shall scan and email or fax the executed certification to Home Depot Storm Water at [stormwater@homedepot.com](mailto:stormwater@homedepot.com) and the fax to 770-384-2005, attn: Civil/Stormwater Mgr.
  - 3.1.1 Contractor shall review and become fully familiar with the Drawings and SWPPP.
  - 3.1.2 Contractor shall revise SWPPP at no additional cost to Owner as necessary to address potential pollution from the Storm Water Site identified after issuance of the SWPPP

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**Construction Specification****EROSION AND SEDIMENTATION CONTROL**

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- 3.1.3 Contractor shall conduct a storm water pre-construction meeting with the Storm Water Site site Subcontractor, all other ground-disturbing Subcontractors and Sub-subcontractors, and the Home Depot Inspector in accordance with the requirements of paragraph 4.3.
- 3.1.4 Owner will mail to Contractor (a) the requisite form designating the Owner's Director of Construction for the Project and (b) the SWPPP certification by Owner. Contractor shall include a copy of each of these forms in the SWPPP Binder.

**3.2 EROSION AND SEDIMENTATION CONTROL AND SLOPE PROTECTION IMPLEMENTATION**

- 3.2.1 Place erosion and sediment control systems in accordance with the Drawings and SWPPP or as may be dictated by site conditions in order to maintain the intent of the Specifications and Storm Water Permits.
- 3.2.2 Deficiencies or changes on the Drawings or in the SWPPP shall be corrected or implemented as site conditions change. Changes during construction shall be noted in the SWPPP and posted on the appropriate Drawings (i.e., all such plans pertaining to storm water and erosion control) within seven (7) calendar days.
- 3.2.3 Owner shall have authority to limit surface area of earth material exposed by clearing and grubbing, excavation, borrow and embankment operations and direct Contractor to provide immediate permanent or temporary stabilization control measures.
- 3.2.4 Maintain temporary erosion and sedimentation control systems as directed by site conditions, indicated in the Contract Documents, or directed by Governmental Authorities or Owner to control sediment until final stabilization. Contractor shall respond to maintenance or additional work ordered by Owner or Governmental Authorities immediately, at no cost to the Owner.
- 3.2.5 Contractor shall incorporate permanent erosion control features, paving, permanent slope stabilization, and vegetation into Project at earliest practical time to minimize need for temporary controls.
- 3.2.6 Permanently seed and mulch cut slopes as excavation proceeds to extent considered desirable and practical to properly protect against erosion per the SWPPP.
- 3.2.7 Unless required within a shorter timeframe by the applicable General Permit for Storm Water Discharges associated with construction activity, any disturbed area left exposed for a period greater than 14 days shall be stabilized with temporary vegetation by the 21<sup>st</sup> day or with the use of other acceptable means in accordance with Section 02940 unless otherwise specified in the Contract Documents. In the event it is not practical to seed areas, slopes must be stabilized with mulch and tackifier, bonded fiber matrix, netting, blankets or other means to reduce the erosive potential of the area. The preference is to implement permanent vegetation in areas that are ready for final stabilization.

**PART 4 -- ENVIRONMENTAL COMPLIANCE****4.1 WARRANTY AND COMPLIANCE WITH LAWS**

- 4.1.1 Warranty and Representation: Contractor shall become familiar with and understand the federal, state and local environmental laws, statutes, regulations, ordinances, permits and other requirements applicable to large construction projects. These requirements shall include, but not be limited to, any and all laws, statutes, regulations and judicial interpretations of the United States, any state in which the Project is located, and any government or quasi-government authority having jurisdiction, that relate to the prevention, abatement and elimination of pollution, storm water control and/or protection of wetlands and/or the

environment, including but not limited to, the federal Comprehensive Environmental Response, Compensation and Liability Act of 1980 ("CERCLA"), 42 U.S.C. § 9601 et seq., the Clean Water Act ("CWA"), 33 U.S.C. §§ 1251-1387 et seq., the Storm Water Laws, the Clean Air Act ("CAA"), 42 U.S.C. § 7401 ET SEQ., Safe Drinking Water Act ("SDWA"), 42 U.S.C. 300f et seq., the Endangered Species Act ("ESA"), 16 U.S.C. § 1531 et seq., and the Toxic Substances Control Act ("TSCA"), 15 U.S.C. § 2601 ET SEQ. together with any state statutes or local ordinances or other requirements serving any similar or related purposes (collectively the "Environmental Laws"). Contractor does hereby warrant and represent to Owner that it is fully aware and familiar with all Environmental Laws relative and applicable to the activities to be performed by the Contractor under terms of the Contract.

#### 4.1.2 Compliance with Environmental Laws

4.1.2.1. The Contractor hereby agrees, warrants and represents that it shall strictly comply with the Storm Water Requirements and all applicable Environmental Laws at all times during the performance of the Contract. Contractor shall also include requirements for such compliance in all Subcontractor and Sub-subcontractor agreements on the Project that are subject to the Contract.

4.1.2.2 If any requirement contained in a federal state or local law, regulation, ordinance, permit or other regulatory requirement applicable to the Storm Water Site or Project is more stringent than any similar requirement contained in this Contract relating to environmental compliance and storm water pollution prevention, the provisions of such regulation, ordinance, permit or other regulatory requirement shall govern.

4.1.2.3 The Contractors Project Superintendent and ITC's are required to obtain all certifications required to meet state or local criteria for site inspections prior to starting construction.

#### 4.2 STORM WATER PROFESSIONALS

##### 4.2.1 Requirements for Storm Water Professional

4.2.1.1 Individuals required to obtain the designation of Storm Water Professional shall successfully complete the EPA-approved, Home Depot sponsored Web-based training in storm water compliance administered by StormwaterONE with a passing grade of seventy-five (75%) percent. In addition, individuals shall attend and successfully complete any federal, state or local training program mandated by the applicable permit and Storm Water Permit. In the event the Owner determines that an individual qualifies as a Storm Water Professional, the individual shall be deemed a Storm Water Professional for one year from the date of certification of passing said training program. Storm Water Professionals shall be required to renew said certification annually by re-taking the Web-based training and achieving a passing grade.

4.2.1.2 Prior to Commencement of Soil Disturbance Activities, Contractor shall provide copies of storm water compliance guidelines, known as U.S. EPA's "Developing Your Storm Water Pollution Prevention Plan A Guide for Construction Site's" May 2007 (EPA 833-R-060-04) and any additional material referenced by the Storm Water Permit to all ground disturbing Subcontractors and Sub-subcontractors, Contractor's personnel responsible for or supervising ground-disturbing activities, site clearing and grading contractors, utility contractors, paving contractors, landscape contractors, concrete contractors, and others as appropriate.

##### 4.2.2 Designation of Contractor's Storm Water Professionals

4.2.2.1 The Contractor for each Storm Water Site shall designate a Project Superintendent who (i) is responsible for overseeing activities and work at a Storm Water Site; and (ii) has the authority to direct employees and Subcontractors and Sub-subcontractors to undertake actions to comply with a Storm Water Permit, the Clean Water Act, and the SWPPP. The Contractor will certify to Owner in writing before the Commencement of Soil Disturbance Activities that the Project Superintendent: (i) is a Storm Water Professional, or will become a Storm Water Professional, within 30 Days of the Commencement of Soil Disturbance Activities and will be accompanied by any other Storm Water Professional until becoming a Storm Water Professional; (ii) has at least 2 years of construction-related experience; and (iii) is able to identify and has the authority on the Storm Water Site for which he or she is designated to implement BMP's and to effectively instruct employees and Subcontractors and Sub-subcontractors in the implementation of such practices. Owner may allow the Contractor to change its Project Superintendent for a Storm Water Site as long as the Contractor certifies to Owner in writing, prior to the change, that the replacement meets these same qualifications.

4.2.2.2 A responsible officer (Vice President or higher) of Contractor shall sign the letters designating the Project Superintendent and certifying as the qualifications of the Project Superintendent. These delegations and certifications shall be in the forms of Appendix SW 3 and SW 4, respectively.

#### 4.3 PRECONSTRUCTION TRAINING AND CERTIFICATIONS

##### 4.3.1 Storm Water Pre-Construction Meeting

4.3.1.1 Prior to Commencement of Soil Disturbance Activities (except for activities associated with the initial installation of BMP's at the Storm Water Site), the Contractor shall hold a storm water pre-construction meeting attended at a minimum by the Contractor, the Home Depot Inspector, Contractor's employees who may engage in or supervise ground-disturbing activities, and the foremen for all Subcontractors and Sub-subcontractors involved in ground-disturbing activities then under contract. Contractor shall give the Home Depot Inspector at least five (5) days prior notice of the proposed time and place for the pre-construction meeting. At that meeting, Contractor shall provide reasonable time for the Home Depot Inspector to discuss each item on Appendix SW 2. Also at that meeting, Contractor shall explain the Storm Water Requirements and environmental requirements for the Storm Water Site to its employees and such Subcontractors and Sub-subcontractors employees in attendance, including such Storm Water Requirements and other environmental requirements that are specific to each sub-contractor's work at the Storm Water Site; and an overview of the SWPPP for the Storm Water Site and potential consequences for failure to comply with the Storm Water Requirements. Following said meeting, the Contractor shall certify in writing to the Owner (which certification shall be (a) in the form attached hereto as Appendix SW 8 and (b) scanned and emailed for faxed to Home Depot Storm Water at [stormwater@homedepot.com](mailto:stormwater@homedepot.com) and the fax to 770-384-2005, attn: Civil/Stormwater Mgr. respectively, that:

- (a) The storm water pre-construction meeting was conducted by the Contractor with Subcontractors and Sub-subcontractors involved in ground-disturbing activities and their employees and the Home Depot Inspector; and.
- (b) Items listed on Appendix SW 2 were covered and explained and recorded on the form attached as Appendix SW 9.

4.3.2 The Contractor shall require each attendee to (a) sign a certification (included on Appendix SW 8) confirming that they understand and will comply with the terms and

conditions of the applicable Storm Water Permit and SWPPP and (b) complete and sign the attendance sheet included on Appendix SW 8. The Contractor must provide the names and email addresses of all ground disturbing Subcontractors and Sub-subcontractors to Home Depot Storm Water. The Contractor's Project Superintendent will scan and email or fax the completed Appendix SW 8 form to Home Depot Storm Water at [stormwater@homedepot.com](mailto:stormwater@homedepot.com) and the fax to 770-384-2005, attn: Civil/Stormwater Mgr. respectively, within 48 hours of the pre-construction meeting. Contactor shall require all ground-disturbing Subcontractors and Sub-subcontractors who are responsible for installation of BMPs to complete and execute the certification in the form of Appendix SW 7, which shall be retained by Contractor in the SWPPP Binder.

- 4.3.3 Notice of Meeting: The Contractor shall give the Home Depot Storm Water Manager at least five (5) days prior notice of the proposed time and place for the pre-construction meeting. The Home Depot Storm Water Manager or another representative may attend the pre-construction meeting in Owner's discretion.

#### 4.4 INSPECTION AND CERTIFICATION OF BMP'S PRIOR TO CONSTRUCTION

- 4.4.1 Project Superintendent shall inspect the Storm Water Site prior to the Commencement of Soil Disturbance Activities at any Storm Water Site (except for activities associated with the initial installation of BMP's at the Storm Water Site), to determine whether the BMP's required by the SWPPP have been installed correctly in the correct locations.
- 4.4.2 Project Superintendent shall certify to the Owner that, based upon his or her personal pre-construction inspection of the Storm Water Site, all BMP's required by the SWPPP have been installed correctly in the correct locations prior to the Commencement of Soil Disturbance Activities and such certification shall be executed by Contractor and emailed in the form of Appendix SW 5 to Home Depot Storm Water at [stormwater@homedepot.com](mailto:stormwater@homedepot.com) and the fax to 770-384-2005, attn: Civil/Stormwater Mgr. respectively.
- 4.4.3 The Contractor shall Remediate any Tasks found during the pre-construction inspection and shall certify to the Owner that the same have been Remediated prior to the Commencement of Soil Disturbance Activities (other than those activities associated with the initial installation of BMP's at the Storm Water Site).
- 4.4.4 Neither the Contractor nor any Subcontractor and Sub-subcontractor shall Commence Soil Disturbance Activities (other than those associated with the initial installations of BMP's at the Storm Water Site) prior to the issuance and effective date of all necessary Storm Water Permit(s) or Contractor's certification(s) described above in paragraphs 4.4.1 through 4.4.3. Any such work performed in violation of this requirement shall be non-compensable, in addition to being subject to the penalties set forth in Part 5 of this section 02370.

#### 4.5 CHANGES TO STORM WATER CONTROLS:

If changes to any storm water erosion or sediment control measures contained in the SWPPP or other documents required by the applicable Storm Water Permit are deemed necessary by Owner's representatives, the Contractor, or the environmental agency having jurisdiction over the Storm Water Site, Contractor shall implement such changes and immediately reflect the same in the SWPPP and other appropriate records for the Storm Water Site.

#### 4.6 WEEKLY MEETINGS

- 4.6.1 In addition to the pre-construction meeting, the Contractor shall hold weekly meetings with its employees and all Subcontractors and Sub-subcontractors involved in ground-disturbing activities and their employees at the Storm Water Site to review the requirements of any applicable Storm Water Permits, the SWPPP, and to address any problems that have arisen in implementing the SWPPP or maintaining BMP's. At said meeting, the Contractor shall review the following: (a) the role of each contractor in installing and or maintaining each BMP, (b) BMP's requiring maintenance or repair; (c) non-effective BMP's; (d) any modifications to the SWPPP or phasing and (e) any efforts to mitigate or stop discharges from the Storm Water Site; (f) coordination of activities to comply with SWPPP in regards to staging areas, storage areas, borrow or fill areas, concrete washout areas, exits, and temporary alterations to BMP's and (g) concerns of any inspections.
- 4.6.2 The Contractor shall maintain a log of all weekly meetings documenting that the issues set forth in Paragraph 4.6.1 were addressed and indicating: (a) the date and time of meeting, and (b) the name, title, and firm name of all attendees, as per the meeting form found in Appendix SW 9 that will be signed and scanned and kept in the SWPPP Binder.
- 4.7 **AVAILABILITY OF PLAN AND PERMIT:**  
The Contractor shall ensure that the applicable Storm Water Permit and SWPPP are readily available at the Storm Water Site, or at a location properly designated by the Storm Water Permit, for review by Owner or any contractor or employee, as well as any local, state, or federal inspector in accordance with any other permit, law or regulation then in effect.
- 4.8 **STORM WATER SITE CONTACT:**  
The Contractor shall post a notice in a conspicuous place in the construction office of the Project and in the form of Appendix SW 13, which notice shall include the email address [stormwater@homedepot.com](mailto:stormwater@homedepot.com) and the name of the Home Depot Storm Water Coordinator, and shall authorize all of Contractor's employees, Subcontractors and Sub-subcontractors to contact the Home Depot Storm Water Coordinator with any questions or report problems relating to erosion control at the Storm Water Site. The Contact List in the form of Appendix SW 12 must be posted at the SWPPP board at the entry to the Job Site. If an inspector of the U.S. EPA or state or local environmental agency should appear at the Storm Water Site to conduct an inspection, the Contractor shall follow the procedures of paragraph 4.8 at the completion of the inspection.
- 4.9 **PROCEDURES DURING STORM WATER INSPECTIONS BY AGENCIES**
- 4.9.1 In the event a representative of the U.S. EPA or state or local environmental agency appears at the Project to conduct an inspection of storm water compliance, the Project Superintendent shall accompany the inspector during the inspection, note all areas of concern or instances of non-compliance with Storm Water Requirements or Environmental Laws noted by the inspector, and if possible, photograph or videotape those areas.
- 4.9.2 Immediately upon completion of the inspection, the Project Superintendent shall complete Appendix SW 15, and email it to the Storm Water Coordinator at [stormwater@homedepot.com](mailto:stormwater@homedepot.com).
- 4.10 **BORROW, WASTE OR SPOILS, AND WASTE STORAGE SITES:**  
In the event that the performance of this Contract by the Contractor requires the development and/or use of borrow, waste or spoils, material (including non-earth)

material, such as block, steel, etc.) storage sites, the Contractor agrees that it shall, prior to the development and/or use of such sites, obtain any permits or approvals necessary for the legal use of such sites or confirm that the operators of such sites have properly obtained all required permits, and shall also comply with all laws, regulations and permit conditions and Environmental Laws applicable to such sites.

#### 4.11 WEEKLY INSPECTIONS AND REMEDIATION

4.11.1 Weekly and Rain-Related Inspections: The Project Superintendent shall conduct an inspection of the Storm Water Site for which that Project Superintendent is responsible at least once each calendar week (Monday to Sunday) and within 24 hours of the end of a storm event of 0.5 inches or greater, and in accordance with any more frequent time frames required by the applicable Storm Water Permit. Note that some state permits now require a storm event inspection of .025 inches or greater. The Project Superintendent shall inspect the entire Storm Water Site, including all disturbed areas, areas used for storage of materials exposed to precipitation; any borrow, waste, spoil and waste storage locations; locations where vehicles enter or exit the Storm Water Site; discharge points or, if accessible, nearby downstream locations; and all erosion and sediment controls to monitor the Storm Water Site's compliance with Storm Water Requirements, to:

- (a) determine whether the SWPPP is being implemented in accordance with the requirements of applicable Storm Water Permit(s) and the Storm Water Requirements;
- (b) identify and record any repairs made to, or needed for, existing BMP's to ensure that they are maintained in effective operating condition;
- (c) identify and record the need to modify and/or to implement additional BMP's to eliminate or significantly minimize discharges of pollutants from the Storm Water Site into waters of the United States; and
- (d) identify and record any discharges, including non-storm water discharges, from the Storm Water Site into waters of the United States, without a Storm Water Permit or in violation of a Storm Water Permit.
- (e) California rain event inspections shall meet all REAP requirements.

4.11.2 If authorized by the applicable Storm Water Permit, Owner may authorize the Project Superintendent to reduce the frequency of his or her inspections to once each month (and within 24 hours of the end of a storm event of 0.5 inches or greater) if the following conditions is met: (1) the entire Storm Water Site is temporarily stabilized, and (2) the store has opened for business to the general public.

4.11.3 The Project Superintendent shall (a) record the results of each weekly and rain-related inspection completely in the inspection form located in EVOCO for that Storm Water Site, (b) certify the accuracy of the information contained in the Inspection Report by electronically signing in the area provided on the Inspection Report, and (c) record all Tasks in the form, set forth in the Log of Tasks.

4.11.4 The Project Superintendent shall ensure that all Tasks identified through the inspections, or that are otherwise necessary to achieve compliance with Storm Water Requirements, are Remediated as soon as possible after the date on which they were identified and, for BMP Task, wherever practicable, before the next storm event, or more expeditiously if required by the applicable Storm Water Permit. If Remediation of a BMP Task before the

next storm event is impracticable, the Project Superintendent shall Remediate the Task as soon as practicable, document the situation in the SWPPP, and implement alternative (e.g., temporary) BMP's as soon as practicable to minimize any discharge in the interim. The Project Superintendent shall record the corrective measures taken and the date each Task was Remediated in the Log of Tasks. In addition, the Project Superintendent shall revise the SWPPP to incorporate any significant changes made to BMP's (e.g., significant change in design, installation, operation or location of controls, significant change in disturbed area or topography, or addition or deletion of outfall points). If a Task is identified by some means other than during an inspection required, it will be added to the Log of Tasks by the completion and submission of an additional Inspection Report form.

- 4.11.5 All repairs or modifications to the BMP's identified as necessary during the weekly inspection shall be completed no later than 7 days after the inspection to the extent practicable; provided, however that if it is impracticable to complete such repairs or modifications within this time, the Contractor shall initiate the repairs within 7 days and diligently pursue completion such that the repairs are completed as soon as practicable.
- 4.11.6 If, during the course of Work at the Storm Water Site, the temporary removal or alteration of a BMP is necessary to accomplish the Work, the Project Superintendent shall note such removal or alteration on the weekly Inspection Report, including specific information regarding the changes made including date and time. The Contractor shall restore the BMP's as soon as practicable but in no case later than 24 hours after the completion of the activity that required the change, and shall note restoration on the weekly Inspection Report including date and time. The Contractor shall take all reasonable measures to prevent discharges of pollutants from the Storm Water Site to the waters of the United States during the time the BMP has been removed or altered, including, but not necessarily limited to timing the removal or alteration of the BMP so that it occurs when precipitation is not forecast and installing new or alternate BMP's elsewhere on the Storm Water Site or outside the affected area.
- 4.11.7 If a spill of a product or products that are environmentally hazardous (as defined by Environmental Laws) occurs during the course of construction the Project Superintendent shall, after the spill is Remediated, complete the spill reporting form attached as Appendix SW 14 and email it to the Storm Water Coordinator at [stormwater@homedepot.com](mailto:stormwater@homedepot.com).
- 4.11.8 Meeting Effluent Guidelines and Numeric Nutrient Limits - Particles that contribute to turbidity can be of such a fine grain that they will not be removed by the mechanisms whereby most best management practices operate, mainly settling and filtration. Active treatment then should be used on stormwater runoff using polymers to remove turbidity, well as total suspended solids and other pollutants.

Stormwater sediment may be treated by: Stormwater holding basin(s), Influent pump, Liqui-Floc injection system, Sand filtration, Backwash system, Backwash holding tank, Influent and effluent turbidity and pH monitoring units, Recycle system, Construction sequencing, Polyacrylamide (PAM), Coagulants and flocculants, Chitosan, Multimedia filtration (mixed-media filtration)

Stormwater with pH levels exceeding water quality standards may be treated by:

1. Applying active products of lime which elevates pH and alum (aluminum sulfate) which lowers pH.

Stormwater with Phosphorus levels exceeding water quality standards may be treated by:

1. Applying alum (aluminum sulfate) at a controlled rate.



**4.12 MONTHLY OWNER INSPECTION:**

At least once a month, with the first inspection to occur within 7 days of the Commencement of Soil Disturbance Activities (except for activities associated with the initial installation of BMP's at the Storm Water Site), the Home Depot Inspector shall perform an independent inspection of the Storm Water Site. The Home Depot Inspector shall be accompanied by the Project Superintendent if available.

**4.13 FINAL OWNER INSPECTION**

4.13.1 Once the Storm Water Site reaches final stabilization and all permanent and temporary erosion and sedimentation controls are removed, the Home Depot Storm Water Manager shall perform an inspection of the Storm Water Site to determine whether all areas of the Storm Water Site have been stabilized in accordance with the Storm Water Permit and the Storm Water Site is eligible to terminate Storm Water Permit coverage. The Home Depot Inspector will then be contacted to do a final monthly inspection and, if at that time it is determined that the Storm Water Site is ready to terminate Storm Water permit coverage, an Inspection Report will be filled out in EVOCO and electronically signed by the Home Depot Inspector and the Home Depot Storm Water Manager.

4.13.2 The Contractor shall file a notice of termination of permit coverage as required by the applicable Storm Water Permit. In the event there are multiple permittees for the Storm Water Site, the Contractor shall prepare the transit notices of termination to each permittee for execution and submittal as required by the applicable Storm Water Permit. If the Storm Water Site has not been stabilized in accordance with the Storm Water Permit, the Contractor and all other permittees shall not file the notices of termination until all stabilization has been completed and the Home Depot Storm Water Manager has repeated the final inspection of the Storm Water Site and certified on the Inspection Report that the Storm Water Site is eligible to terminate Storm Water Permit coverage.

**4.14 RETENTION OF RECORDS BY THE CONTRACTOR:**

The Contractor shall retain, in files that are readily accessible, all records required by the applicable Storm Water Permit or other Storm Water Requirements or Environmental Laws applicable to the Project for a minimum of three (3) years after close-out of the Project, or for such longer time as may be required by said Storm Water Permit, Storm Water Requirements or Environmental Laws. Such records shall, without limitation, include the Storm Water Permit, the SWPPP, all related control Drawings, all reports, notices of violation, the NOI, NOT, SWPPP Binder, marked up Site maps or other orders and documents relative to storm water controls at the Storm Water Site. Changes, modifications, revisions or deletions shall become a part of the SWPPP as they occur. The Contractor shall provide copies of any such records at the Contractor's sole expense and within 48 hours of Owner's notice to Contractor requesting such information.

**4.15 ENVIRONMENTAL VIOLATIONS**

4.15.1 In the event that during the performance of work by the Contractor:

- (a) a State or Federal notice of violation, administrative order, or judicial action has been initiated based on allegations that:
  - (i) Owner or the Contractor has failed to conduct or document an inspection as required by Storm Water Requirements,
  - (ii) Owner or the Contractor has failed to repair, maintain, or modify BMP(s) as required by Storm Water Requirements, or
  - (iii) a discharge without a Storm Water Permit has occurred at or from the Storm Water Site: or

- (b) Owner determines that the Contractor has failed on three or more occasions to:
  - (i) conduct or document an inspection as required by Storm Water Requirements, or
  - (ii) repair, maintain, or modify BMP(s) as required by Storm Water Requirements, the Contractor shall notify the Owner immediately of such event, and shall prepare and provide to the Owner within 5 calendar days of such event a Remediation plan capable of resolving such compliance issues and preventing their recurrence.

**4.16 STORM WATER COMPLIANCE AUDIT:**

Owner may from time to time, in its sole discretion, retain an independent consultant to conduct inspections of the Storm Water Site to determine whether the Contractor has complied with the Storm Water Requirements of Environmental Laws. Owner shall not be required to disclose or otherwise provide the findings or recommendations of the audit consultant to the Contractor and may, in its sole discretion, elect to voluntarily disclose or provide such findings to any Governmental Authority. The Contractor hereby waives, and releases Owner and audit consultant from, any and all claims, liabilities, damages, causes of action, penalties or fines, whether direct, or indirect or consequential, arising from or relating in any way to the compliance audit.

**4.17 RIGHT TO TAKE CORRECTIVE ACTION:**

In the event Owner discovers that the Contractor has failed to correct any deficient BMP or to eliminate or reduce any discharge of pollutants from the Storm Water Site which are identified by the Inspection Report observed by any of Owner's employees or representatives, Owner may, within twenty-four (24) hours of notification thereof to Contractor, or immediately without notice if there is an imminent threat of a discharge from the Storm Water Site, take such corrective actions as may be necessary to correct such BMP or eliminate or reduce such discharge. The Contractor shall reimburse Owner for any costs incurred in taking such corrective action within fourteen (14) days of receipt of written notice and demand by Owner.

**4.18 SUPERVISION**

4.18.1 A minimum of one (1) full time Project Superintendent shall be provided by the Contractor exclusively for the Project. No work shall be performed under this Contract unless at least one Project Superintendent is present on the Storm Water Site.

4.18.2 The Contractor shall provide the following equipment at the Job Site trailer to coordinate between the Job Site and Owner.

- (a) Computer with email internet connection
- (b) Digital Camera with interface to required computer

**4.19 ULTIMATELY,**

it is the responsibility of the Contractor to assure adequacy of Storm Water Site pollutant discharge controls. Actual physical site conditions or contractor practices could make it necessary to install more structural controls than shown on the Drawings. Assessing the need for additional controls and or implementing or adjusting controls will be a continuing aspect of the SWPPP until the NOT is filed.

**PART 5 -- PENALTIES FOR NONCOMPLIANCE**

**5.1 PENALTY ASSESSMENT AND PAYMENT**

- 5.1.1 If Contractor fails to comply fully and timely with the requirements of Section 02370 of the Specifications (or Exhibit SW: Storm Water Management Specifications (02370) as may be attached to and included in this Contract in the event that this Contract does not include Specifications with Section 02370) or the terms of any applicable Storm Water Permit, upon written notice by Owner to Contractor, Contractor shall pay Owner Storm Water Penalties in the amounts set forth in the Schedule of Storm Water Penalties set forth below. If the Project is administered using Expesite, such notice by Owner may be sent to Contractor via a Project Notification in Expesite in lieu of sending such notice via courier service mail.
- 5.1.2 All Storm Water Penalties owed to Owner under this Article shall be due and payable by Contractor within thirty (30) calendar days of Owner's notice to Contractor demanding payment of the penalties. All such payments shall be made by check to the order of an escrow account named by Owner in its notice to Contractor of a Storm Water Penalty. If payment is not made within the thirty (30) day period, the amount of Storm Water Penalty shall be credited against the Contract Sum.
- 5.1.3 Storm Water Penalties shall begin to accrue on the day after performance is due or the day a violation occurs and shall continue to accrue through the final day of the correction of the noncompliance or completion of the activity. Separate Storm Water Penalties may be assessed for separate violations even if such violations occur simultaneously. Storm Water Penalties shall accrue regardless of whether Owner has notified Contractor of a violation.
- 5.1.4 The payment of Storm Water Penalties shall not alter in any way Contractor's obligation to comply with any other requirement of this Contract, including without limitation the requirements of Section 02370 of the Specifications (or Exhibit SW: Storm Water Management Specifications (02370) as noted above) and any applicable Storm Water Permit .
- 5.1.5 Storm Water Penalties established herein are not the Owner's exclusive remedy for violations of the requirements of Section 02370 of the Specifications (or Exhibit SW: Storm Water Management Specifications (02370) as noted above) or the terms of any applicable Storm Water Permit. Owner expressly reserves the right to seek any other remedy otherwise available to it under this Contract, or at law or in equity.

**5.2 SCHEDULE OF STORM WATER PENALTIES:**

- 5.2.1 For failure to submit a Notice of Intent or otherwise obtain a Storm Water Permit in Contractor's name as required by Section 02370 of the Specifications (or Exhibit SW: Storm Water Management Specifications (02370) as noted above) or the terms of any applicable Storm Water Permit, law or regulation, \$1,000 per day of violation;
- 5.2.2 For failure to provide the pre-construction contractor acknowledgment required by Section 02370 of the Specifications (or Exhibit SW: Storm Water Management Specifications (02370) as noted above), \$1000 per violation;
- 5.2.3 For Commencement of Soil Disturbance Activities (except for activities associated with the initial installation of BMP's at the Storm Water Site)
- (a) prior to the correct installation in the correct locations of all BMP's required by the SWPPP or

- (b) prior to receipt by Owner of Contractor's pre-construction certification pursuant to Section 02370 of the Specifications (or Exhibit SW 5: Storm Water Management Specifications (02370) as noted above) that all BMP's required by the SWPPP have been correctly installed in the correct locations, \$5,000;
- 5.2.4 For each day after the Commencement of Soil Disturbance Activities (except for activities associated with the initial installation of BMP's at the Storm Water Site) and prior to receipt by Owner of Contractor's pre-construction certifications of compliance pursuant to Section 02370 of the Specifications (or Exhibit SW: Storm Water Management Specifications (02370) as noted above), \$500 per day per requirement that has not been certified;
- 5.2.5 For failure to update any SWPPP within the time required by Section 02370 of the Specifications (or Exhibit SW: Storm Water Management Specifications (02370) as noted above) or the terms of any applicable Storm Water Permit, \$1000 per day of violation;
- 5.2.6 For failure to install, repair, maintain, modify or add BMPs and to document the Storm Water Remediation, all as required by Section 02370 of the Specifications (or Exhibit SW: Storm Water Management Specifications (02370) as noted above) or the terms of any applicable Storm Water Permit, \$1500 per day of violation;
- 5.2.7 For failure to timely conduct an inspection on the schedule established by Section 02370 of the Specifications (or Exhibit SW: Storm Water Management Specifications (02370) noted above) or the terms of any applicable Storm Water Permit, \$1,000 for each missed inspection by a Project Superintendent;
- 5.2.8 For failure to perform or document an inspection in the manner required by Section 02370 of the Specifications (or Exhibit SW: Storm Water Management Specifications (02370) as noted above) or the terms of any applicable Storm Water Permit, \$1,000 for each such instance.

**APPENDICES****MEETING TOPIC OUTLINES APPENDICES**

- APPENDIX SW 1. THIS SECTION INTENTIONALLY LEFT BLANK
- APPENDIX SW 2. PRE-CONSTRUCTION CONFERENCE CHECKLIST

**CERTIFICATION FORMS**

- APPENDIX SW 3 GENERAL CONTRACTOR / SUB CONTRACTOR DELIGATION LETTER
- APPENDIX SW 4. CERTIFICATION OF PROJECT SUPERINTENDENT STORM WATER QUALIFICATIONS
- APPENDIX SW 5. OPERATOR/GC CERTIFICATION SWPPP BMP IMPLIMENTATION
- APPENDIX SW 6. SWPPP CERTIFICATION CONTRACTOR/ SUB CONTRACTOR
- APPENDIX SW 7. SUB CONTRACTOR/ GC CERTIFICATION

**REQUIRED MEETINGS**

- APPENDIX SW 8. PRE-CONSTRUCTION MEETING CERTIFICATION FORM GENERAL CONTRACTOR AND GROUND-DISTURBING SUBCONTRACTORS
- APPENDIX SW 9. WEEKLY STORM WATER MEETING REVIEW AND COMMENT FORM

**TRAINING**

- APPENDIX SW 10. THIS SECTION INTENTIONALLY LEFT BLANK
- APPENDIX SW 11. THIS SECTION INTENTIONALLY LEFT BLANK

**NOTICES**

- APPENDIX SW 12. CONSTRUCTION SITE NOTICE
- APPENDIX SW 13. CONTACT LIST

**MISC**

- APPENDIX SW 14. SPILL REPORTING FORM
- APPENDIX SW 15. FEDERAL, STATE, OR LOCAL STORM WATER OR OTHER ENVIRONMENTAL INSPECTOR SITE VISIT LOG

**MEETING TOPIC OUTLINES APPENDICES**

APPENDIX SW 1. NOT APPLICABLE

APPENDIX SW 2. PRE-CONSTRUCTION CONFERENCE CHECKLIST

**PRE-CONSTRUCTION CONFERENCE CHECKLIST****Appendix SW 2**

Items to be covered during Pre-Construction Conference, confirmation that the General Contractor:

1. Is aware of its obligation to obtain a copy of the applicable Permit.
2. Will file any Notice of Intent required in addition to the Notice of Intent required to be filed by Home Depot.
3. Has a copy of, understands, and will comply with the requirements of the Decree, including, but not limited to, briefing its employees and its subcontractors and their employees, qualifications of its Project Superintendents, updating SWPPPs, performing inspections, recording results of the inspections, and Remediating Tasks.
4. Must implement all BMPs identified in the initial SWPPP prior to the Commencement of Construction Activities (except for activities associated with the initial installation of BMPs at a Site).
5. Must certify to Home Depot that all such BMPs have been put in place prior to Commencement of Construction Activities (except for activities associated with the initial installation of BMPs at a Site).
6. That all applicable Permits have been obtained and posted, and that those Permits and the SWPPP are available at the Site.
7. That a notice providing the name and email address of Home Depot's Storm Water Coordinator is available at the Site.
8. That guidance material is available at the Site.
9. That the General Contractor has designated a qualified Project Superintendent.
10. That the General Contractor has held or will hold pre-construction Site-specific briefings for its employees and for subcontractors and their employees.

Discussion of the following:

1. The SWPPP for the project.
2. Site-specific factors, including site-specific placement of BMPs and the presence of any protected waters or wetlands on or near the site.
3. Project sequencing, and how that sequencing will affect BMP locations.

**CERTIFICATION FORMS**

APPENDIX SW 3.	GENERAL CONTRACTOR / SUB CONTRACTOR DELIGATION LETTER
APPENDIX SW 4	CERTIFICATION PROJECT SUPERINTENDENT STORM WATER QUALIFICATIONS
APPENDIX SW 5.	OPERATOR/GC CERTIFICATION SWPPP BMP IMPLIMENTATION
APPENDIX SW 6.	SWPPP CERTIFICATION CONTRACTOR/ SUB CONTRACTOR
APPENDIX SW 7.	SUB CONTRACTOR/ GC CERTIFICATION



# General Contractor/Sub Contractor Delegation Letter

## Appendix SW 3

Delegation Letter to the General Contractor/Sub

Contractor will be emailed to you upon award of

contract. Upon completion of the form please email

to [stormwater@homedepot.com](mailto:stormwater@homedepot.com)

Put in subject line: project name/state/and form name, or  
fax to XXX-XXX-XXXX Attn: Civil/Stormwater Mgr.

**Construction Specification****EROSION AND SEDIMENTATION CONTROL**

[Contractor to complete before initiation of ground disturbing activities]  
Store Number: \_\_\_\_\_ Project Location: \_\_\_\_\_

**Certification of Project Superintendent Storm Water Qualifications  
Appendix SW 4**

I certify under penalty of law that Project Superintendent:

- |            |                     |
|------------|---------------------|
| Name _____ | Certificate # _____ |
|------------|---------------------|
- 1) is a Storm Water Professional\*, or will become a Storm Water Professional within or the beginning of ground-disturbing activity and will be accompanied on at least 3 weekly inspections by the Compliance Officer until becoming a Storm Water Professional;
  - 2) has at least 2 years of construction-related experience; and
  - 3) is able to adequately identify and implement storm water sediment and erosion control practices and effectively instruct employees and contractors in the implementation of such practices.

Contractor Company Name _____	Date _____
-------------------------------	------------

Signature of Officer of the Company and Title \_\_\_\_\_

\*A Storm Water Professional is an individual who is currently certified through the storm water training program provided by Home Depot pursuant to a training plan approved by EPA.

**This form cannot be altered.**

Send completed form to Home Depot Storm Water, scan and email to [stormwater@homedepot.com](mailto:stormwater@homedepot.com) or fax to 770-384-2005. Put in subject line: project name/state/and form name. Copy to be kept in Job Site SWPPP Binder tab marked "SW 4" certification of compliance officer and project superintendent storm water qualifications.

**OPERATOR/GENERAL CONTRACTOR CERTIFICATION**  
**STORM WATER POLLUTION PREVENTION PLAN BEST MANAGEMENT**  
**PRACTICES IMPLEMENTATION**

**Appendix SW 5**

Date: \_\_\_\_\_

Project Type and Store Number: \_\_\_\_\_

We certify that on this date an inspection of the Storm Water Site and Best Management Practices (BMPs) required by the SWPPP have been installed correctly and in the correct locations according to the Erosion and Sediment Control Site Plan, exceptions to plan are listed below. Other than ground disturbance to install the BMPs, no other ground disturbing activities have occurred on the site nor will ground disturbing activities occur on this Storm Water Site until all exceptions have been resolved. As the General Contractor's Project Superintendent I have re-inspected the Storm Water Site and certify that exceptions to the Best Management Practices were completed prior to construction activities.

\_\_\_\_\_  
(Superintendent)

\_\_\_\_\_  
(Company Name)

Exceptions (list): \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

ALL EXCEPTIONS TO THE PLAN MUST BE REMEDIATED PRIOR TO THE COMMENCEMENT OF  
SOIL DISTURBANCE ACTIVITIES

Send completed form to Home Depot Storm Water, scan and email to [stormwater@homedepot.com](mailto:stormwater@homedepot.com) or fax to 770-384-2005. Put in subject line: project name/state/and form name. Copy to be kept in Job Site SWPPP Binder tab marked "SW 5" Operator/GC certification SWPPP BMP implementation.

**Storm Water Pollution Prevention Plan Certification  
Contractor/Subcontractor  
Appendix SW 6**

**The General Contractor/Subcontractor is aware of its obligation to obtain a copy of the permit and will file the General Contractors Notice of Intent required per State Regulations. The General Contractor is to update the SWPPP, perform inspections, document the results and Remediate Tasks. I understand and will comply that all BMP's will need to be in place prior to Commencement of Soil Disturbance Activities according to SWPPP.**

*"I certify under penalty of law that I have read and understand the terms and conditions of the NPDES General Permit for Storm Water. I am authorized by this general permit, and must comply with the terms and conditions of this permit, including but not limited to the requirements of the Storm Water Pollution Prevention Plan. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."*

**Company Name:** <General Contractor's Name>

**Company**

**Address:** \_\_\_\_\_

**Company Phone:** \_\_\_\_\_

**Project or Site:** Home Depot

**Signature:** \_\_\_\_\_

**Printed Name:** \_\_\_\_\_

**Title:** <must be signed by an officer of the company>

**Date:** \_\_\_\_\_

Send completed form to Home Depot Storm Water, scan and email to [Stormwater@homedepot.com](mailto:Stormwater@homedepot.com) or fax to 770-384-2005. Put in subject line: project name/state/and form name. Copy to be kept in Job Site SWPPP Binder tab marked "SW 6" SWPPP certification contractor/ sub contractor.

**SUB CONTRACTOR/GC  
CERTIFICATION**  
Appendix SW 7

Store Number: \_\_\_\_\_ Project Location: \_\_\_\_\_

The Contractor and/or Subcontractor(s) and their employees that will implement and maintain the pollutant control measures described in the SWPPP and/or are involved in ground-disturbing activities on the Storm Water Site must be identified below. [This form will be modified to meet the specific State General Permit requirements] Each must sign a statement certifying that they understand the General Permit authorizing storm water discharges during construction. These statements must be maintained in the SWPPP Binder on Job Site.

Contractor: \_\_\_\_\_

Company Name \_\_\_\_\_

Business Address \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Business Telephone Number \_\_\_\_\_

CERTIFICATION: [Modify the certification specific to state General Permit requirements as applicable]

***"I certify that I understand the terms and conditions of the National Pollutant Discharge Elimination System (NPDES) General Permit that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification. The SWPPP has been made available to me to review and I agree to stay in compliance with the permit."***

Signature \_\_\_\_\_

Date \_\_\_\_\_

Printed Name \_\_\_\_\_

Title \_\_\_\_\_

The above listed contractor is responsible for the following BMPs: (check all that apply)

<input checked="" type="checkbox"/>	Best Management Practice	<input checked="" type="checkbox"/>	Best Management Practice	<input checked="" type="checkbox"/>	Best Management Practice
<input type="checkbox"/>	Construction Exit	<input type="checkbox"/>	Diversions	<input type="checkbox"/>	Solid Waste
<input type="checkbox"/>	Silt Fence	<input type="checkbox"/>	Sediment Traps	<input type="checkbox"/>	Sanitary Waste
<input type="checkbox"/>	Check Dams	<input type="checkbox"/>	Sediment Basins	<input type="checkbox"/>	Hazardous Waste Management
<input type="checkbox"/>	Inlet Protection	<input type="checkbox"/>	Dust Control	<input type="checkbox"/>	Record Keeping/SWPPP modifications
<input type="checkbox"/>	Erosion Control	<input type="checkbox"/>	Concrete Wash-out	<input type="checkbox"/>	
<input type="checkbox"/>	Vegetation	<input type="checkbox"/>	Fuel Storage/Containment	<input type="checkbox"/>	

Copy is to be kept in Job Site SWPPP Binder tab marked "SW 7" sub contractor/GC certification.

**REQUIRED MEETINGS**

APPENDIX SW 8	PRE-CONSTRUCTION MEETING CERTIFICATION FORM GENERAL CONTRACTOR AND GROUND-DISTURBING SUBCONTRACTORS
APPENDIX SW 9	WEEKLY STORM WATER MEETING REVIEW AND COMMENT FORM

**PRE-CONSTRUCTION MEETING CERTIFICATION FORM  
GENERAL CONTRACTOR AND GROUND-DISTURBING SUBCONTRACTORS****Appendix SW 8**

Date: \_\_\_\_\_

Store Number: \_\_\_\_\_ Project Location \_\_\_\_\_

General Contractor: \_\_\_\_\_

The Pre-Construction meeting between the Project Superintendent, of the Contactor, the Home Depot Inspector representative, and Subcontractors and Sup-subcontractor(s) and their employees who will be involved in ground-disturbing activities has been completed successfully.

I have read and understand all items listed in Appendix SW-2 – Pre-Construction Checklist. Each item listed on Appendix SW-2 Pre-Construction Checklist has been discussed and recorded on form Appendix SW-9 (Weekly SWPPP Meeting Review) to verify the Contractor is aware and understands their role and takes responsibility on this Project.

*"I certify that I have attended this meeting and that I understand the terms and conditions of the National Pollutant Discharge Elimination System (NPDES) General Permit that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification. The SWPPP has been made available to me to review and I agree to stay in compliance with the permit."*

Signature of Project Superintendent of General Contractor

Date

Print Name	Signature	Job Title	Company Name

Send completed form to Home Depot Storm Water, scan and email to [stormwater@homedepot.com](mailto:stormwater@homedepot.com) or fax to 770-384-2005. Put in subject line: project name/state/and form name. Copy to be kept in Job Site SWPPP Binder tab marked "SW 8" pre-construction meeting certification form general contractor and ground-disturbing subcontractors.



**Weekly Storm Water Meeting Review and Comment Form**  
**Appendix SW 9**

Store Number and Project Location: \_\_\_\_\_

Project Site Superintendent: \_\_\_\_\_ Date and Time: \_\_\_\_\_

Others Present: NAME	TITLE	COMPANY

Role of Contractors with installation and maintenance of BMPs: \_\_\_\_\_

BMP Maintenance and Repair: \_\_\_\_\_

Non-effective BMPs: \_\_\_\_\_

Efforts to mitigate or stop sediment discharges: \_\_\_\_\_

Coordination of staging areas, storage, borrow, fill, concrete wash-out, and exits: \_\_\_\_\_

Upcoming activities: \_\_\_\_\_

Modifications or additions to SWPPP or project phasing: \_\_\_\_\_

Findings and Conclusions: \_\_\_\_\_

Misc. \_\_\_\_\_

Copy to be kept in Job Site SWPPP Binder tab marked "SW 9" weekly storm water meeting review and comment form.

**TRAINING**

APPENDIX SW 10. NOT APPLICABLE

APPENDIX SW 11. NOT APPLICABLE

**NOTICES**

APPENDIX SW 12 CONSTRUCTION SITE NOTICE

APPENDIX SW 13. CONTACT LIST

# CONSTRUCTION SITE NOTICE

FOR THE  
State Water Resources Control Board  
Division of Water Quality

**NPDES GENERAL PERMIT**  
**Appendix SW 12**

<b><u>NPDES Permit Number:</u></b>		
<b><u>Contractor Firm:</u></b>		
<b><u>Contractor Address:</u></b>		
<b><u>Contact Name &amp; Number</u></b>		
	Name	Phone Number
<b><u>Project Description:</u></b>	(Store Type, Store Number, Address square feet of building, and disturbed area (use large font size and bold))	
<b><u>Location of the SWPPP:</u></b>		

Copy to be kept in Job Site SWPPP Binder tab marked "SW 12" construction site notice.

Please post on the SWPPP Board at Entry to Site

## Contact List

### Appendix SW 13

Store Number: \_\_\_\_\_ Project Location: \_\_\_\_\_

Home Depot Storm Water Coordinator: **David S. Kazerooni, PE** [stormwater@homedepot.com](mailto:stormwater@homedepot.com)

Responsible for coordinating oversight of storm water compliance by Home Depot and it's Responsible Contractors at each site.

Home Depot Project Manager: Name: \_\_\_\_\_

Responsible for compliance by Home Depot and its General Contractor with Storm Water Requirements at the Site.

Responsible for the supervision or completion of construction at a site and able to adequately identify and implement storm water sediment and erosion control practices and effectively instruct employees and contractors in the implementation of such practices.

Project Superintendent: Name: \_\_\_\_\_

Firm: \_\_\_\_\_

Phone (office): \_\_\_\_\_

Phone (mobile): \_\_\_\_\_

Responsible for overseeing activities and work at a site; has the authority to direct employees and contractors to undertake actions to comply with a Storm Water Permit, the Clean Water Act, and the site's SWPPP.

Kept original in Job Site SWPPP Binder tab marked "SW 13" contact list. Post in a conspicuous place.

**MISC**

- APPENDIX SW 14. SPILL REPORTING FORM
- APPENDIX SW 15. FEDERAL, STATE, OR LOCAL STORM WATER OR OTHER  
ENVIRONMENTAL INSPECTOR SITE VISIT LOG

**Construction Specification****EROSION AND SEDIMENTATION CONTROL****SPILL REPORTING FORM****Appendix SW 14**

Project Type and Location: \_\_\_\_\_ Store Number: \_\_\_\_\_

Spill Reported by: \_\_\_\_\_

Date/Time of Spill: \_\_\_\_\_ Time Incident Contained: \_\_\_\_\_

Spill Location and Events Leading to Spill: \_\_\_\_\_

Material Spilled: \_\_\_\_\_

Source of Spill: \_\_\_\_\_

Amount Spilled: \_\_\_\_\_ Amount Spilled to Waterway: \_\_\_\_\_

Surface Area of Impacted Media in sq. ft.: \_\_\_\_\_ Type of Media (Soil or Pavement): \_\_\_\_\_

Corrective Action Taken: \_\_\_\_\_

Action Taken to Prevent Future Spills: \_\_\_\_\_

Agencies Notified: \_\_\_\_\_

Modifications to Storm Water Pollution Plan: \_\_\_\_\_

*"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."*

\_\_\_\_\_  
Signature of Reporter\_\_\_\_\_  
Date\_\_\_\_\_  
Printed Name/Title\_\_\_\_\_  
Company

HDSWCC must be contracted as soon as possible after the form is completed, email copy to [stormwater@homedepot.com](mailto:stormwater@homedepot.com) or fax to 770-384-2005. Copy to be kept in Job Site SWPPP Binder tab marked "SW 14" spill reporting form.

## Federal, State, or Local Storm Water or other Environmental Inspector Site Visit Log

Appendix SW 15

Store Number: \_\_\_\_\_ Project Location: \_\_\_\_\_

Regulator's Name: \_\_\_\_\_ Agency: \_\_\_\_\_

Contractor's Representative Present: \_\_\_\_\_

Others Present: \_\_\_\_\_

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Time and Date: \_\_\_\_\_ Report Prepared: Yes No

At the conclusion of any agency inspection, the HDSWCC must receive a copy of this form, email it to [stormwater@homedepot.com](mailto:stormwater@homedepot.com). General Contractor must provide as a minimum the date, inspection beginning and completion times, inspecting agency, agency inspector name, all contractor representative names, and a brief summary of any comments, observations or deficiencies noted during the inspection.

Original to be kept in Job Site SWPPP Binder tab marked "SW 15" federal, state, or local storm water or other environmental inspector site visit log.



**Construction Specification****ASPHALT CONCRETE PAVING****PART 1 - GENERAL****1.01 DESCRIPTION**

- A. Work included: Asphalt paving of drives and parking areas as indicated on the drawings and as specified herein.
- B. Related work specified elsewhere:
  - 1. Section 01411 – Testing and Inspection
  - 2. Section 02200 – Earthwork
  - 3. Section 02520 – Portland Cement Concrete Paving
  - 4. Section 02580 – Pavement Marking

**1.02 QUALITY ASSURANCE**

- A. The Owner will employ and pay for the services of an Independent Testing Contractor (ITC) to provide testing and inspections of the asphalt paving.
- B. The services of the ITC, and the information provided by the ITC, are provided for the sole benefit of Owner. The information is provided to Contractor only so the Contractor is aware of what is being reported to Owner. The Contractor shall not, and is not entitled to, rely upon any information provided by the ITC in any manner. Contractor is solely responsible for assuring that the Work complies with the Contract Documents in all respects and may not rely on the ITC for this, or any other, assurance. The ITC and its representatives are not authorized to revoke, alter, relax, enlarge or release any requirements of the Contract Documents, approve or accept any portion of the Work, perform or excuse any duties of Contractor, or be a party to the scheduling of the Work. The ITC is not an authorized agent of the Owner with respect to the relationship between Owner and Contractor.
- C. Asphalt paving materials and operations shall be tested and inspected as the work progresses. Failure by the ITC to detect any defective work or material shall not in any way prevent later rejection (when such defect is discovered) nor shall it obligate the Owner for final acceptance.
- D. See Section 01411 Testing and Inspection for a complete description of the services to be performed by the ITC and additional Contractor responsibilities to facilitate that work.

**PART 2 - PRODUCTS****2.01 PAVING**

- A. Paving shall consist of the following:
  - 1. Standard duty (auto driveways and parking) pavement shall be as indicated on drawings.
  - 2. Heavy duty (truck driveway pavement) shall be as indicated on drawings.
  - 3. Road widening and resurfacing: Pavement shall be as indicated on the drawings.

**2.02 ASPHALT**

- A. Asphaltic Concrete: Hot, plant-mixed bituminous material in accordance with local jurisdictional requirements and per the Geotechnical Report criteria.
- B. Prime shall be a bituminous material conforming to the reference standards.
- C. Asphaltic Paving (Topping) Material - Plant Mix: The above "Aggregate for Asphaltic Pavement" must be heated in a continuous kiln until all moisture in the aggregate has been driven off. Then while aggregate is absolutely dry and hot, 5.8% - 6.0% of AC20 asphalt cement by weight must be thoroughly mixed with it so that all particles are completely covered. Material should be delivered to the job as it is mixed.

**2.03 BASE**

- A. The graded aggregate base shall conform with local jurisdictional requirements and per the Geotechnical Report criteria.

**PART 3 - EXECUTION****3.01 PREPARATORY WORK**

- A. Before commencing of asphalt paving, all concrete walks, strips and concrete paint adjoining the paving shall be installed. Prior to placing of base, the construction of all utility lines which are to be placed under the pavement shall have been completed.

**3.02 PREPARATION OF SUBGRADE**

- A. The area to receive base course and pavement shall be excavated to proper depth to obtain the finish contours and elevations shown on drawings. After grading, the entire surface shall be checked for unstable soil areas which are not suitable for subgrades by the Soil Engineer. These areas must be excavated to reach stable soil and then be backfilled with suitable materials. The entire area then shall be rolled to required compaction as per Section 02200 - EARTHWORK.

### 3.03 APPLICATION OF BASE

- A. The base course shall be constructed in accordance with local jurisdictional requirements and per the Geotechnical Report criteria. All base shall have minimum compaction of 95% of the maximum density obtained by the test procedure presented to ASTM D-698- 70 Method D (Standard Proctor). Maximum permissible lift thickness shall be 6" (compacted). A soils engineer selected and paid for by the Owner shall make soil and compaction tests on the subgrade and base courses. Results of such tests will be given to the Architect of Record. Cost of all tests made that show compaction not meeting the specifications shall be paid for by the Contractor. All costs of reworking the subgrade and base courses to specified compaction and retesting shall be paid for by the Contractor.

### 3.04 APPLICATION OF BINDER AND ASPHALT PAVING

- A. When the base stabilization has been completed and when material is dry with a temperature above 60 degrees, it must be prime-coated with one coat of AE-P cut-back asphalt heated. Fill all voids in the base stabilization course and adhere the topping immediately following application of prime-coat.
- B. The asphaltic paving material specified shall be placed at a temperature of 275°F. to 350° F. at the time of application, then the material must be mechanically rolled to compact topping to depths herein specified, after compaction which must not further settle or compact under the weight of a ten ton loaded truck when outside temperature is 90°F. The surface must be smooth, true to contours and elevations shown on the drawings and impervious to water.
- C. Minimizing the number of joints, place the asphalt in the most continuous line as can possibly be done. Multiple course placement shall overlap joints by minimum 6 inches.
- D. After surface is rolled to final elevations the pavement area shall be protected and allowed to cool and harden before any traffic is allowed on the surface.

END OF SECTION

**Construction Specification****PORTLAND CEMENT CONCRETE PAVING****PART 1 - GENERAL****1.01 SUMMARY**

- A. This section gives requirements for Portland Cement Concrete Pavement, with or without curbs, placed on a prepared subgrade and/or other base material. This section applies to concrete paving, curbs, and sidewalks specified on the Civil Engineers Site Plan. The construction of slabs on ground for the building floor and all exterior flatwork shown on the structural plans shall be as specified in section 03390.

- B. Related work specified elsewhere includes but may not be limited to:

1. Section 01411 – Testing and Inspection
2. Section 02200 – Earthwork
3. Section 02513 – Asphalt Concrete Paving
4. Section 03300 – Cast-In-Place Concrete
5. Section 03390 – Slab on Ground (As shown on the Structural Plans)

**1.02 MEASUREMENT AND PAYMENT**

- A. Measurement: See Bid Proposal Form for required unit price breakdown

**1.03 RELATED DOCUMENTS**

- A. Unless otherwise shown or specified, the work shall conform to the following standards of the American Association of State Highway and Transportation Officials (AASHTO):

1. AASHTO T318: Standard Test For Water Content of Freshly Mixed Concrete Using Microwave Oven Drying

- B. Unless otherwise shown or specified, the work shall conform to the following standards and recommendations of the American Concrete Institute (ACI):

1. ACI 117: Standard Tolerances for Concrete Construction and Materials.
2. ACI 211.1: Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete.
3. ACI 301: Specifications for Structural Concrete
4. ACI 305R: Hot Weather Concreting
5. ACI 306.1: Standard Specification for Cold Weather Concreting
6. ACI 308.1: Standard Specification for Curing Concrete
7. ACI 309R: Guide for Consolidation of Concrete
8. ACI 318: Building Code Requirements for Structural Concrete
9. ACI 325.6R Texturing Concrete Pavements
10. 325.9R Guide for Construction of Concrete Pavements and Concrete Bases
11. 330R Guide for the Design and Construction of Concrete Parking Lots

- C. Unless otherwise shown or specified, the work shall conform to the following standards of the American Society for Testing and Materials (ASTM):

1. ASTM A 615: Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
2. ASTM A 706: Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement
3. ASTM C 31: Making and Curing Concrete Test Specimens in the Field.
4. ASTM C 33: Concrete Aggregates.
5. ASTM C 39: Concrete Specimens, Compressive Strength of.
6. ASTM C 94: Ready-Mixed Concrete.
7. ASTM C 136: Sieve Analysis of Fine and Coarse Aggregates.
8. ASTM C 150: Portland Cement.
9. ASTM C 171: Sheet Materials for Curing Concrete.
10. ASTM C 260: Air-Entraining Admixtures for Concrete.
11. ASTM C 494: Chemical Admixtures for Concrete.
12. ASTM C 702: Reducing Field Samples of Aggregate to Testing Size.
13. ASTM C 1315: Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
14. ASTM D 75: Sampling Aggregates.
15. ASTM D 448: Aggregate for Road and Bridge Construction.
16. ASTM D 698: Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lb/ft<sup>2</sup> (600 kN-m/m<sup>2</sup>))
17. ASTM D 1557: Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lb/ft<sup>2</sup> (2,700 kN-m/m<sup>2</sup>))
18. ASTM D 1751: Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).
19. ASTM D1752: Standard Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction

- 20. ASTM D3575: Standard Test Methods for Flexible Cellular Materials Made From Olefin Polymers
- D. Unless otherwise shown or specified, the work shall conform to the following standards of the Concrete Reinforcing Steel Institute (CRSI):
  - 1. CRSI: Manual of Standard Practice
  - 2. CRSI: Placing Reinforcing Bars
- E. Unless otherwise shown or specified, the work shall conform to the following standards of the Federal Specifications (FS): FS TT-S-00230c (2): Sealing Compound; Elastomeric Type, Single Component (for Caulking, Sealing, and Glazing in Buildings and Other Structures).
- F. Unless otherwise shown or specified, the work shall conform to the following standards of the American Plywood Association (APA): APA: Grading Rules.
- G. Unless otherwise shown or specified, the work shall conform to the following standards of the Portland Cement Association (PCA): Design and Control of Concrete Mixtures.
- H. Unless otherwise shown or specified, the work shall conform to the following standards of the National Ready-Mix Concrete Association: NRMCA Inspection Standards.
- 1.04 SUBMITTALS
  - A. Follow the procedure for submittals as outlined in Section 03300 Cast-In-Place Concrete.
  - B. Contractor to submit test data for the sulphate content of imported base materials that will be in contact with the concrete pavement.
  - C. Contractor to submit shop drawings for pavement joint reinforcing.
- 1.05 QUALITY ASSURANCE
  - A. The Owner will employ and pay for the services of an Independent Testing Contractor (ITC) to provide testing and inspections of the concrete work.
  - B. The services of the ITC, and the information provided by the ITC, are provided for the sole benefit of Owner. The information is provided to Contractor only so the Contractor is aware of what is being reported to Owner. The Contractor shall not, and is not entitled to, rely upon any information provided by the ITC in any manner. Contractor is solely responsible for assuring that the Work complies with the Contract Documents in all respects and may not rely on the ITC for this, or any other, assurance. The ITC and its representatives are not authorized to revoke, alter, relax, enlarge or release any requirements of the Contract Documents, approve or accept any portion of the Work, perform or excuse any duties of Contractor, or be a party to the scheduling of the Work. The ITC is not an authorized agent of the Owner with respect to the relationship between Owner and Contractor.
  - C. Concrete materials and operations shall be tested and inspected as the work progresses. Failure by the ITC to detect any defective work or material shall not in any way prevent later rejection (when such defect is discovered) nor shall it obligate the Owner for final acceptance.
  - D. See Section 01411 Testing and Inspection for a complete description of the services to be performed by the ITC and additional Contractor responsibilities to facilitate that work.
- 1.06 DELIVERY, STORAGE, AND HANDLING
  - A. Reinforcing Steel: All steel reinforcement shall be stored above the ground on platforms, skids of other supports as approved by the Owner's ITC. Reinforcement shall be stored in a location such that it is protected from mechanical injury and rust. When placed in the work, steel reinforcement shall be free from dirt, scale, rust, oil, paint and other material.
  - B. Miscellaneous Materials: All miscellaneous materials that are to be used to properly execute the work required to construct concrete pavement shall be stored and handled in accordance with the manufacturer's instructions and/or in a manner that meets with the approval of the Owner's ITC.
- 1.07 ENVIRONMENTAL CONDITIONS
  - A. Concreting in Hot, Dry and/or Windy Weather:
    - 1. Conform to ACI 305R when any combination of high air or concrete temperature, low relative humidity, and wind velocity tend to impair quality of concrete.
    - 2. Employ special precautions when evaporation rate as obtained from ACI 305R is expected to reach 0.2 pound per square foot per hour or more.

**Construction Specification****PORTLAND CEMENT CONCRETE PAVING**

3. Unless otherwise allowed, reject concrete if its temperature before placement is over 90°F.
  4. Unless otherwise allowed, during hot weather mixing and delivery (discharge) time to be shorter than specified in ASTM C 94 as follows:
    - a. When air temperature is between 85°F and 90°F, reduce allowable mixing and delivery time from 90 minutes to 75 minutes.
    - b. When air temperature is over 90°F, reduce allowable mixing and delivery time to 60 minutes.
  5. Do not place concrete when forms, subgrade, base, or reinforcing bars are more than 120°F or more than 10°F hotter than ambient air temperature.
  6. Cool with water or water-soaked burlap as necessary, but allow no standing water on surface on which concrete is placed.
- B. Concreting in Cold Weather:**
1. Conform to ACI 306.1 when temperature and other environmental conditions are as noted therein and following additional requirements:
    - a. Frozen base and subgrade soils shall be thawed immediately before placing concrete.
  2. Do not place concrete on subgrade, or base that is more than 20°F cooler than concrete. Warm subgrade, or base to decrease temperature differential to 20°F or less.
- C. Precipitation Protection:** Protect surfaces of exposed concrete from precipitation until adequate strength is gained to prevent damage.

**PART 2 - PRODUCTS****2.01 MATERIALS**

- A. General:**
1. All materials shall meet the requirements of Section 03300 except as modified herein.
- B. Cement**
1. Type I, II, or V
  2. Use type appropriate for the sulphate exposure from subgrade or base materials in contact with concrete. Reference ACI 318 Building Code Requirements for Structural Concrete.
- C. Aggregates:**
1. ASTM C 33, with following requirements:
    - a. Consider concrete not covered by building materials or soil to be subject to abrasion and in severe weathering region.
    - b. Unless otherwise allowed, allow no coal or lignite in concrete that will not be covered by building materials or soil.
  2. Do not use manufactured sand for concrete pavement, curbs or sidewalks unless blended with natural sand or otherwise allowed.
  3. Concrete pavement shall conform to following, unless otherwise allowed (not required for curbs and sidewalks):
    - a. Of total combined coarse and fine aggregates per mix design, do not allow material retained on any 1 sieve to be less than 6% nor more than 24% of total by weight, except:
      - i. Largest course aggregate size to be #4 stone, unless otherwise noted. Retain 1% to 8% of total combined aggregates per mix design on largest sieve with retained aggregate.
      - ii. Maintain 6% to 15% of total combined aggregates per mix design retained on each of Nos. 30 and 50 sieves.
      - iii. Maintain 3% to 5% of total combined aggregates per mix design retained on No. 100 sieve.
    - b. Gradation requirement of ASTM C 33 may be waived in order to meet ranges specified.
- D. Admixtures:**
1. General:
    - a. No admixture to contain more than 0.05% chloride ions. Submit certificate of compliance to this requirement.
  2. Types:
    - a. Air-entraining: ASTM C 260.
    - b. Water-reducing: ASTM C 494, Type A.
    - c. Retarding: ASTM C 494, Type B or D.
    - d. Accelerating: ASTM C 494, Type C or E. Non-chloride.
      - i. Acceptable Products and Manufacturers:
        - a). Euclid Chemical Corp.: Accelguard 80
        - b). Master Builders Solutions: MasterSet AC 534
        - c). Grace Concrete Products: Darex AEA
- E. Fly Ash or Slag:** Not permitted, unless Type V cement is unavailable, or it is insufficient to mitigate by itself, when it is

**Construction Specification****PORTLAND CEMENT CONCRETE PAVING**

required to resist severe sulfate exposure or unless it is needed as a means of mitigation against potential aggregate reactivity. See Section 03300 for additional information.

**F. Reinforcing Support Devices:**

1. Follow CRSI's "Manual of Standard Practice".
2. Over fine or coarse aggregate base, use precast concrete chairs (blocks) with properly embedded the wires or other type of supports acceptable to Owner's Representative to prevent penetration of substrate. Plastic chairs shall not be used.
3. Do not use wood, brick, and other such devices that can expand due to moisture gain.
4. Precast concrete chairs (blocks) to have minimum compressive strength of 4000 psi.

**G. Aggregate Base Materials**

1. General
  - a. Aggregate base materials must meet the minimum requirements of the Florida Department of Transportation.
  - b. Base materials shall have negligible sulfate content with less than 0.1% soluble concentration by weight or less than 150 ppm in water.
2. Coarse Aggregate Base
  - a. Unless not available or otherwise recommended by Owner's Geotechnical Engineer, use crusher run road base with rock fines. Otherwise follow Owner's Geotechnical Engineer's recommendations.
3. Fine Aggregate Base:
  - a. Clean granular fill with less than 3% clay and/or friable particles.
  - b. Provide gradation per ASTM D 448 No. 10 with 6% to 12% passing No. 200 sieve or following table:

<u>Std. Sieve Size%</u>	<u>Passing</u>
No. 4	100
No. 8	85-100
No. 16	75-95
No. 50	55-75
No. 100	25-45
No. 200	10-30
	6-12

**H. Formwork:**

1. Plywood for Concrete Surfaces Not to be Exposed After Construction is Complete:
  - a. APA B-B Plyform exterior grade or better, Class I, with straight, sealed edges and 5/8 inch minimum thickness.
  - b. HDO Plyform is acceptable.
2. Plywood for Concrete Surfaces to be Exposed After Construction is Complete: APA HDO Plyform, exterior grade or better, Class I, with straight, sealed edges and 5/8 inch minimum thickness.
3. Lumber: Dressed, tongue and grooved, free from loose knots.
4. Metal: Smooth, clean, corrosion-free, without dents or holes, with closely matching edges.
5. Fiberglass: Smooth, clean, without dents or holes, with closely matching edges.
6. "Laser-Form" by Greenstreak not permitted.

**I. Form Release Agents:**

1. Type acceptable to cement manufacturer, will not cause surface imperfections, non-staining, and compatible with field applied paints, curing compounds, and other coatings.
2. Use same brand form release agent for all forms.

**J. Form Accessories:**

1. Form ties, anchors and hangers of sufficient strength to completely resist displacement of forms due to construction loads and depositing of concrete.
2. Provide ties and spreader form ties designed so no metal will be within 1 inch of surface when forms are removed.
3. Where concrete surfaces are exposed to view, use form ties that will leave a depression not more than 1 inch in diameter when removed.
4. Provide form sealants and gaskets as necessary to provide tight forms.

**K. Evaporation Retardant:**

1. Water-based polymer, sprayable.
2. A minimum of 5 gallons is to be on site at the time of concrete placement.
3. Acceptable Products and Manufacturers:

**Construction Specification****PORTLAND CEMENT CONCRETE PAVING**

- a. Dayton Superior: Aquafilm J74RTU
  - b. Euclid Chemical Co.: Euco-bar
  - c. Master Builders Solutions (BASF): MasterKure ER 50
  - d. SpecChem: SpecFilm RTU Finishing Aid Surface Retarder
- L. Screed Chairs: Metal; wood not permitted.
- M. Firm Performed Joint Filler: ASTM D 1751, non-extruding, full depth of concrete. Used at isolation joints unless noted otherwise.
- N. Backer Rods and Backing Materials:
1. Provide a compressible type material such as closed-cell, resilient foam or sponge rubber stock of vinyl, butyl or neoprene, or expanded polyethylene or polyurethane.
  2. The diameter of the backer rod shall be at least twenty-five (25) percent larger than the joint reservoir and shall be capable of holding the fluid joint sealing compound in open joint in place.
  3. Backer rods shall be of such a type that it will not bond to the joint sealing compound
- O. Concrete Pavement Joint Sealant
1. Used at construction joints, contraction joints, and isolation joints in Heavy Duty and Light Duty pavement (excluding sidewalks)
  2. Acceptable Products:
    - a. DOW Corning: 888 Silicone Joint Sealant
- P. Sheet Materials for Moist Curing Concrete Pavement: ASTM C 171
1. Synthetic Fiber/Plastic Sheet, multiple use sheets:
    - a. White synthetic fiber matting securely attached to white plastic sheet backing.
    - b. Ensure used sheets are clean, serviceable, functional and approved for use by the Owner's Representative.
    - c. Acceptable Product and Manufacturer:
      - i. PNA Construction Technologies: HydraCure™ - M5
      - ii. Reef Industries: Transguard 4000
  2. Synthetic Fiber/Plastic Sheet, single use sheets:
    - a. White synthetic fiber matting securely attached to white plastic sheet backing.
    - b. Ensure sheets are new and have never been used before.
    - c. Acceptable Product and Manufacturer:
      - i. Reef Industries: Transguard EG
      - ii. PNA Construction Technologies: HydraCure™ – S16
  3. Cellulose Fiber/Plastic Sheet, single use sheets:
    - a. White cellulose fiber matting securely attached to clear plastic sheet backing.
    - b. Ensure sheets are only used in areas that are protected from direct sunlight.
    - c. Ensure sheets are new and used only one time.
    - d. Acceptable Product and Manufacturer:
      - i. McDonald Technology Group: UltraCure NCF
  4. Cellulose Fiber/Plastic Sheet, single use sheets:
    - a. White cellulose fiber matting securely attached to white plastic sheet backing.
    - b. Ensure sheets are new and used only one time.
    - c. Acceptable Product and Manufacturer:
      - i. McDonald Technology Group: UltraCuresun
- Q. High Solids Curing Compound for curing concrete pavement
1. Conform to ASTM C 1315, Type I, Class A.
  2. 25% minimum solids content.
  3. Acceptable Products and Manufacturers:
    - a. Dayton Superior: Cure & Seal LV 25%, J20 UV
  4. Acceptable VOC compliant products and manufacturers (use only where local VOC restrictions prohibit the use of the products listed above, confirm compliance with local authorities)
    - a. Dayton Superior: Cure & Seal 1315 EF
    - b. Euclid Chemical Company: Super Diamond Clear VOX
- R. Pavement Liquid Membrane Curing and Sealing Compound
1. Conform to ASTM C 1315, Type I, Class A.
  2. 25% minimum solids content.
  3. Acceptable Products and Manufacturers:
    - a. Dayton Superior: Cure & Seal LV 25%, J20 UV
    - b. Euclid Chemical Corp.: Super Rez-Seal or Super Diamond Clear
  4. Acceptable VOC compliant products and manufacturers (use only where local VOC restrictions prohibit the use of the

**Construction Specification****PORTLAND CEMENT CONCRETE PAVING**

products listed above, confirm compliance with local authorities)

- a. Dayton Superior: Cure & Seal 1315 EF
- b. Euclid Chemical Company: Super Diamond Clear VOX

S. Joint Reinforcing - Heavy Duty Pavement:

1. Applicable to primary drive lanes used by semi-trucks, delivery trucks and/or emergency vehicles. See Civil drawings.
2. Doweled for vertical load transfer. Use smooth plate dowels, smooth round bar dowels, or square bar dowels of ASTM A 36 material. Do not shear. Remove burrs. Locate dowels at mid-depth of pavement unless noted otherwise.
3. Construction Joints
  - a. Keyways not permitted.
  - b. Unless noted otherwise, position dowels at mid-depth of pavement with pocket formers or dowel aligners anchored to bulkhead forms.
  - c. Use lubricant on dowel as required on one side of joint to prevent dowel from bonding to concrete and to allow un-restrained concrete pavement shrinkage.
4. Contraction Joints
  - a. Use pre-assembled wire baskets to support dowels at mid-depth of pavement. ASTM A 108 wire.
  - b. Only weld dowel to one side of basket. Attachment at opposite side of basket shall allow the dowel to slip as pavement shrinks. Alternate weld side of adjacent dowels.
  - c. Use lubricant on dowel at un-welded side of basket as required to prevent dowel from bonding to concrete and to allow un-restrained concrete pavement shrinkage.

T. Joint Reinforcing - Light Duty Pavement

1. Applicable to pavement subject to vehicular traffic, customer parking and not otherwise classified as Heavy Duty Pavement.
2. Construction Joints
  - a. Doweled for vertical load transfer, keyways not permitted.
    - i. Position dowels with pocket formers or dowel aligners anchored to bulkhead forms.
    - ii. Ensure dowel is not bonded to concrete on one side of joint to allow concrete pavement shrinkage.
3. Contraction joints
  - a. Un-doweled unless shown otherwise on Civil drawings

U. Joint Reinforcing – Sidewalks

1. Not required unless shown otherwise on Civil drawings

V. Polypropylene Fiber Reinforcement Products and Manufacturers:

1. Euclid Chemical Company: Fiberstrand 150 ML
2. Fibermesh Co.: Fibermesh 150
3. Forta Corp.: Econo-Mono
4. Grace: Microfiber
5. Nycon: ProConM
6. PSI Packaging: Multi-Mix 80 MicroFiber

2.02 PROPORTIONS

A. General:

1. Use only materials and their proportions included on Concrete Mix Design Submittal Forms approved for this project.
  2. Measure and mix ingredients in accordance with most stringent requirements of ACI 211.1, ACI 301, and ASTM C 94.
- B. Minimum 28-day compressive strength shall have a 28-day compressive strength of 3,500 psi.
- C. Workability: Must have proper consistency to be worked readily into forms and around reinforcement without segregation, voids or, excessive bleeding.



**Construction Specification****PORTLAND CEMENT CONCRETE PAVING**

- D. Minimum Cementitious Materials Content for all pavement, curbs, or sidewalks shall be in accordance with the following table from ACI 302.1R.

**MINIMUM CEMENTITIOUS MATERIALS CONTENT FOR FLOORS**

Nominal Maximum Size Aggregate (in.)	Cementitious Materials Content (lb/yd <sup>3</sup> )
1 1/2	470
1	520
3/4	540
1/2	590
3/8	610

- E. Water/Cement Ratio:

1. All other pavement, curbs, or sidewalks maximum w/cm = 0.55.

- F. Slump:

1. Unless otherwise allowed, proportion concrete so slump without adding water-reducing admixtures would be a maximum of 4" ± 1" tolerance. The slump of the concrete prior to the addition of water-reducing admixture shall be between 2" and 3". The slump of the concrete containing water-reducing admixture shall not exceed 8". The slump of the concrete shall be determined prior to the addition of the water-reducer and at the point of discharge.

- G. Admixtures:

1. Water-reducing admixture may be added to improve workability and reduce water content.
2. Mid-range water-reducing admixture may be added to improve workability or pumpability.
3. Provide an air-entraining admixture only where air-entrainment is specified.
4. Other admixtures may be used only with written approval of Owner's Representative.
5. Do not use calcium chloride as an additive or in admixtures.
6. Use admixtures in accordance with manufacturer's recommendations.

- H. Polypropylene Fibers:

1. For those pavements specifically identified as fiber reinforced on the drawings, polypropylene fibers having a maximum length of ¾" shall be added to the mix at a dosage rate of 1.0 lb/yd<sup>3</sup>. Follow the manufacturer's recommendations for proper mixing.

**2.03 MIXING**

- A. Ready-Mixed Concrete:

1. Mix and transport in accordance with ASTM C 94 and ACI 301, except as specified.
2. Reset drum revolution counter to zero on ready-mix concrete truck when water is added to drum.

- B. Site-Mixed Concrete:

1. Conform to ACI 301.
2. Use central-mix type batch plant, unless otherwise allowed.

- C. Special Requirements for Polypropylene Fibers:

1. Follow fiber manufacturer's recommendations.
2. After adding fiber to concrete, mix concrete at mixing speed for 5 minutes minimum, or until fibers are properly dispersed throughout concrete.

**2.04 FABRICATION**

- A. Reinforcing:

1. Fabricate reinforcing in accordance with ACI SP-66. Do not heat reinforcing bars for bending purposes, unless otherwise allowed by Owner's Representative.
2. Tie reinforcing bars in bundles and tag with non-rusting tags showing Shop Drawing numbers.
3. When welding of reinforcement is specified or permitted, comply with AWS D1.4. Do not tack-weld crossing bars for assembly of reinforcement, supports or embedded items, unless otherwise allowed.

**PART 3 - EXECUTION**

**Construction Specification****PORTLAND CEMENT CONCRETE PAVING****3.01 GENERAL**

- A. Design, construct, erect, support, and remove formwork and related items in accordance with most stringent requirements of ACI 117, 301, and 318.
- B. Place reinforcing in accordance with most stringent requirements of ACI 117, 301 and 318 and CRSI Manual of Standard Practice and Placing Reinforcing Bars.
- C. Unless otherwise specified, place concrete in accordance with ACI 301. If proportioning design mix on basis of laboratory trial batches, do not place concrete until Owner's ITC has reviewed results of design mix 7 day test breaks and permission is given to proceed.
- D. Ensure that all work is properly coordinated:
  1. Civil Drawings and Specifications with those of other disciplines.
  2. Use final corrected Shop Drawings, and placing Drawings.
- E. Provide for concrete supplier to have quality control representative at site for placements of concrete pavements.
- F. Conform to manufacturer's printed instructions for materials and equipment.

**3.02 PREPARATORY WORK**

- A. Pre-placement Inspection: Ensure all trades and other participants involved signify that all preparations are in conformance with Contract Documents.
- B. Coarse Aggregate Base:
  1. Unless otherwise allowed, install coarse aggregate base where shown on Drawings.
  2. Compact to final thickness shown in layers not exceeding 6 inches, with minimum of 2 passes per layer with vibratory compactor.
  3. Compact fill to 95% of aggregate's Modified Proctor as determined by Method D of ASTM D 1557.
  4. Choke-off top surface with fine aggregate base material (see below).
  5. Provide dry, smooth, flat, dense surface.
- C. Cleaning Equipment: Remove hardened concrete and foreign materials from mixing and conveying equipment.
- D. Formwork:
  1. Unless otherwise noted on Drawings, form vertical surfaces of concrete work.
  2. Formwork for concrete surfaces to be painted or exposed to view after completion of project to meet following requirements:
    - a. No dents, holes, or patches.
    - b. Individual formwork elements are as large as possible.
    - c. Position individual formwork elements in regular, uniform pattern with all joints aligned.
    - d. Construct forms for removal without hammering or prying against concrete.
  3. Clean all formwork.
  4. Remove rust from steel formwork.
  5. Solidly butt joints and provide backup at joints as required to prevent leakage of cement paste.
  6. Before placing reinforcing steel, thoroughly coat contact surfaces of forms with an approved form release agent, if it is to be used.
  7. Apply form release agent evenly without excess drip.
  8. Do not allow form release agent to come into contact with concrete surfaces against which fresh concrete will be placed, unless noted otherwise.
  9. Moisten wood forms immediately before placing concrete where form release agents are not used.
  10. Just before placing concrete, clean forms and adjacent surfaces again as necessary. Remove wood, sawdust, chips, dirt and other debris.
  11. Provide slab side forms such that by placing a 10-foot straightedge anywhere on side of form hitting 2 points, gap at any point between straightedge and form does not exceed 1/8 inch.
- E. Fine Aggregate Base:
  1. Compact to final thickness noted with 2 passes minimum with vibratory compactor to produce smooth, flat, dense surface.
  2. Unless otherwise allowed, fine aggregate to be dry immediately before placing concrete.
  3. Prior to placing concrete, the base shall be proof-rolled with a fully loaded dump truck, or other acceptable means.
  4. The Owner's ITC shall monitor the proof rolling. The properly prepared subgrade will depress a maximum of a 1/2" under a fully loaded dump truck.
- F. Pavement Reinforcing:

**Construction Specification****PORTLAND CEMENT CONCRETE PAVING**

1. Place all reinforcement in accordance with the shop drawings.
  2. Accurately place and secure reinforcement against displacement by firmly wiring at intersections and splices with not less than No. 18 U.S. Standard Gage annealed wire, or by use of clipping devices permitted by Owner's Representative.
  3. Turn the wire ends away from concrete exterior.
  4. Ensure reinforcing is clean, free from defects and kinks, loose mill or rust scale or coatings that will reduce bond.
  5. Protect exposed reinforcing bars, inserts and plates intended for bonding with future expansion from corrosion by approved means.
  6. When welding of reinforcement is specified or permitted, comply with AWS D1.4. Do not tack-weld crossing bars for assembly of reinforcement, supports or embedded items, unless otherwise allowed.
- G. Miscellaneous items:
1. Accurately place and secure against displacement miscellaneous steel, pipe sleeves, inserts, anchors, performed joint fillers, and miscellaneous embedded items.
  2. Unless noted otherwise on Drawings, ensure corner protection bars and other similar embedded metal items are continuous between concrete joints. If shorter lengths are required for metal items, connect the ends by butt-welding entire joint and grinding smooth exposed surface. Ensure embedded metal items are discontinued at construction, contraction and isolation joints.
  3. Temporarily fill voids in sleeves and inserts with easily removable materials.
  4. Before placing concrete on ground, piping and other utilities under concrete to be inspected and tested and excavations backfilled and properly compacted to solid bearing, as specified.
- H. Joints:
1. Provide construction, isolation and contraction joints as indicated on Drawings and as noted below.
  2. For bulkheads for construction joints use 1'-1/2 inch minimum thick lumber; do not use preformed metal bulkheads that will stay in place, unless approved by Owner's Representative.
  3. Provide bulkheads full depth of member.
  4. Space joints to allow 1 continuous placement between bulkheads.
  5. Maximum spacing between joints to be 24 times the pavement thickness creating square or rectangular areas between construction, contraction, or isolation joints with a length-to-width ratio less than 1.5:1, but preferably less than 1.25:1.
  6. Construction Joints – Heavy Duty and Light Duty Concrete Pavement, excluding sidewalks unless noted otherwise on the Civil drawings
    - a. Place joint reinforcement in accordance with the shop drawings and/or the manufacturer's installation details.
  7. Contraction Joints - Heavy Duty Concrete Pavement only, unless shown otherwise on the Civil drawings
    - a. Center dowel basket assemblies below joint, with dowel bars perpendicular to the joint and in a plane parallel to finished pavement surface.
    - b. Stake the basket assembly to the ground to prevent it from sliding or floating during concrete placement.
- I. Embedments:
1. Accurately position and securely anchor materials embedded in concrete.
  2. Thicken concrete slabs as required to maintain the intended slab thickness at embedded items.
  3. Secure embedments to formwork when possible, not only tied or welded to reinforcement.
  4. Install clean embedments. After concrete placement, clean embedment exposed surfaces of concrete splatter and other foreign substances.
- 3.03 CONVEYING
- A. General: Handle concrete from mixer to place of final deposit as rapidly as practicable and in manner, which will assure obtaining specified quality of concrete.
  - B. Retempering: Discard concrete which has already begun to set; do not retemper with water.
  - C. Equipment: Provide mixing and conveying equipment of proper size and design to ensure a continuous flow of concrete to delivery end. Provide conveying equipment subject to Owner's Representative's review. Do not use aluminum pipe or equipment in contact with concrete.
1. Mixers, agitators and non-agitating units: Conform to ASTM C 94 and current certification requirements of Department of Transportation in state where concrete plant is located.
  2. Belt Conveyors:
    - a. Use only types that will not cause segregation.
    - b. Discharge runs over 30 feet into a hopper.
  3. Chutes: Metal or metal lined installed at slopes not exceeding 1 vertical to 3 horizontal. Ensure chutes with greater slopes or chutes over 20 feet in length discharge into a hopper.
  4. Runways:
    - a. Provide runways or other means above finished concrete level for wheeled conveying equipment.
    - b. Do not support runways on reinforcing.
    - c. Do not wheel equipment directly over reinforcing or metal deck.

**Construction Specification****PORTLAND CEMENT CONCRETE PAVING**

5. Pumps:
  - a. Submit to Owner's Representative for review all changes in concrete mix to necessitate pumping.
  - b. Use pump hoses and other slickline components with 5-inch minimum inside diameter, unless otherwise allowed by Owner's Representative.
  - c. For slickline reducers ensure reduction in diameter is no more than 1 inch over 5-foot length.
  - d. Submit to Owner's Representative method of operating pump hoses so as to prevent displacement of reinforcing steel, dowels, form, and aggregate base

**3.04 DEPOSITING****A. Placing:**

1. The location of all construction and contraction joints shall be as indicated on the Civil Drawings, and no deviations shall be allowed. In no case shall the contractor place more concrete than can be properly and completely finished and saw cut in one day.
2. General:
  - a. Do not deposit concrete that has partially hardened or has been contaminated by foreign matter.
  - b. Deposit concrete continuously in layers of such thickness that no concrete will be deposited on concrete which has hardened sufficiently to cause seams or planes of weakness.
  - c. Between construction joints place concrete in a continuous operation such that concrete is plastic at all times and flows readily into spaces between reinforcement
  - d. Do not subject concrete to procedures that will cause segregation.
  - e. Deposit concrete as near as possible to its final position.
3. Do Not:
  - a. Place concrete over standing water, mud, frost, ice or snow.
  - b. Do not use wet screeds unless permitted by Owner's Representative.

**B. Consolidation:**

1. General:
  - a. Consolidate concrete complying with ACI 309R by vibrating, spading or rodding so that concrete is thoroughly worked around reinforcing, and embedded items and into the corners of forms.
  - b. Consolidate each layer of concrete with previously placed layers in manner that will eliminate air or stone pockets that may cause honeycombing, pitting or places of weakness.
  - c. Do not insert vibrator into portions of concrete that have begun to set unless allowed by Owner's Representative.
  - d. Do not use vibrators to transport concrete
  - e. Keep spare vibrator on job site during concrete operations.
2. Formed Elements: Use internal vibrators, not form vibrators, unless allowed by Owner's Representative.
3. Pavement:
  - a. Consolidate slabs with laser screed, vibrating bridge screed or other means allowed by Owner's Representative.
  - b. Use internal vibration along construction joints.
  - c. If bar reinforcing is used, use internal vibration around bars.
  - d. Do not use grate tampers, jitters or mesh rollers, unless allowed by Owner's Representative.
  - e. Move vibrating screed, if used, steadily and as fast as practicable, keeping an adequate surcharge of concrete at forward edge of screed.
  - f. Vibrate under all plate dowels. Mark forms before concreting to properly locate dowels after concreting.

- C. Formwork: After concrete placement, adjust forms and bracing as necessary to maintain proper alignment and eliminate leakage of cement paste.

**3.05 FINISHING PROCEDURES****A. General:**

1. Unless otherwise allowed, do not add water to any slab surface during finishing operations.
2. Do not add plain, dry cement to any slab surface during finishing operations.
3. Unless otherwise allowed, perform no finishing operation while water is present on slab surface.
4. If concrete is firm enough for floating but substantial amount of bleed water is still on surface, water may be removed by 1 of following methods:
  - a. Fans or blower heaters.
  - b. If concrete surface is stiff enough to not be damaged, rubber hose may be dragged slowly over surface 1 time, without disturbing surface.
  - c. For slabs with fibers, follow fiber manufacturer's recommendations.

- B. Concrete Pavement Finish: The pavement shall be struck-off and consolidated with mechanical finishing machines or by hand-finishing methods. Adjacent concrete curbs shall be given the same finish as the concrete pavement. The Owner's Representative shall approve the finish following the initial placement.

1. Mechanical Finishing: When mechanical finishing machines are used for finishing, the concrete shall be struck-off at such a height that after consolidation and final finishing, it shall be at the exact elevation as shown on the plans. The

**Construction Specification****PORTLAND CEMENT CONCRETE PAVING**

- mechanical finishing machines shall consist of a power driven transverse finishing machine and a longitudinal finishing machine. Finishing machines shall be equipped with rubber ties for rolling on concrete pavement. The transverse finishing machine shall be provided with two (2) screeds that are accurately adjusted to the pavement slope or crown as indicated on the plans. The transverse finishing machine shall ride on the forms and be so designated and operated as to strike off and consolidate the concrete. The CONTRACTOR shall make at least two (2) trips over the pavement area with the transverse finisher but shall make as many trips over the pavement area as required to obtain the required grades. The longitudinal finishing machine shall ride on the forms and be equipped with a longitudinal float not less than ten (10) feet in length. The machine shall be so designed and operated as to finish the pavement to the grades and elevations shown on the plans. Just before the concrete becomes non-plastic, the pavement surface shall be belted with a canvas belt with a width between six (6) and ten (10) inches wide and length at least two (2) feet longer than the pavement width. The belt shall be moved with short strokes transversely across the pavement and advanced rapidly in the longitudinal direction to produce a gritty, textured surface.
2. Hand Finishing: when the pavement is finished by hand, the concrete shall be struck-off with a screed of an approved cross section and a length at least two (2) feet longer than the pavement width. The strike-off screed shall be moved forward with combined transverse and longitudinal motion in the direction the work is progressing, maintaining the screed in contact with the forms and keeping a slight excess of material in front of the cutting edge. The concrete shall then be tamped with an approved tamping template to thoroughly compact it and eliminate surface voids. The surface shall then be screeded to the required section. After completion of the strike-off, tamping and transverse screeding, a longitudinal float shall be operated to level the surface to the required grade. Just before the concrete becomes non-plastic, the surface shall be belted with a canvas belt as described in the preceding subparagraph to produce a gritty, textured surface.

**3.06 PAVEMENT JOINTS**

- A. General: Construction and contraction joints shall match the joint layout provided on the drawings. No exceptions.
- B. Construction Joints: Shall be located at the discretion of the Contractor, observing the placement limits previously established.
- C. Contraction Joints:
1. Use saws, blades, skid plates, and accessories from Soft-Cut International, Inc. Early entry saw cuts shall be initially 1/8" wide.
  2. Have two "Soft-Cut" early entry saws minimum on site, with blades capable of achieving the required depth of saw cut.
  3. Start cutting sawed joints as soon as concrete has hardened sufficiently to prevent raveling or dislodging of aggregates.
  4. For "Soft-Cut" early entry saw, this will typically be from 1 hour in hot weather to 4 hours in cold weather after completing finishing of slab in that joint location.
  5. Capability: Employ sufficient number of saws and workers to complete cutting sawed joints before the time noted above and before shrinkage produces cracking.
  6. See Drawings for additional requirements.

**3.07 CONCRETE CURING**

- A. General:
1. Cure concrete in accordance with ACI 301 and ACI 308.1, except as noted.
  2. Start curing as soon as curing operations will not damage concrete surface.
  3. Continuously cure concrete pavement, for at least 7 consecutive days
  4. During curing period, do not allow any part of concrete to become dry if sheet materials are being used.
  5. If using forms for curing, keep forms in contact with concrete wet during curing period unless type of form is impervious to water, such as metal or fiberglass.
  6. If forms are removed before curing period is complete, continue curing immediately with other approved methods.
- B. Methods of Curing: Cure concrete surfaces with one of the following methods:
1. Moist Cure
    - a. Moisten exposed surfaces of concrete after completing finishing and then apply sheet smoothly with no wrinkles or folds, pre-wetted, with edges lapped 6 inches minimum and sealed and secured in such manner as to prevent moisture escaping from concrete from laps or edges. Keep sheet moist during curing period.
    - b. Liquid curing compounds sprayed or rolled uniformly on vertical pavement edges only immediately following form removal operation. Apply curing compound in accordance with manufacturer's recommendations. Immediately recoat, at the rate specified above, surfaces subjected to rainfall within 3 hours after compound has been applied or surfaces damaged by subsequent construction operations within the curing period.
  2. High Solids Curing Compound
    - a. Follow manufacturer's instructions for the application rate and procedures.
    - b. Use the high solids curing compounds noted above.
- C. Concrete Protection:

**Construction Specification****PORTLAND CEMENT CONCRETE PAVING**

1. Barricade concrete surfaces immediately after finishing.
2. Do not allow light traffic, except for curing purposes, on concrete surfaces until concrete has obtained 1800 psi compressive strength.
3. Do not allow heavy traffic on concrete surfaces until concrete has obtained its design strength noted on Drawings, by test.
4. Adequately protect concrete inserts and other embedded items from movement, mechanical injury or from damage by elements.

**3.08 FORM REMOVAL****A. General:**

1. Do not remove forms until concrete has hardened sufficiently to support its own weight and imposed construction loads.
2. Remove forms in manner to avoid damage to concrete.

**3.09 JOINT SEALING**

- A. Applicable to Heavy Duty and Light Duty Concrete Pavement. Not applicable to sidewalks unless shown otherwise on the Civil drawings.
- B. Wait as long as possible for pavement shrinkage to occur prior to placing sealant.
- C. Ensure joint width meets the minimum requirements established by the sealant manufacturer. Re-saw joints as required just prior to placing sealant to meet the sealant manufacturer's minimum requirements.
- D. Place backer rod and sealant per the manufacturer's recommendations.
- E. Tool the sealant to recess into the joint as per the manufacturer's recommendations and details.

**END OF SECTION**

**PART 1 - GENERAL****1.01 DESCRIPTION**

- A. This Section includes, but is not limited to water distribution, and sanitary sewer systems.
- B. The extent of utility work is shown on the drawings. Systems shall start at a point approximately 5'-0" beyond the exterior wall of the building and extend to termination unless otherwise indicated on the drawings.
- C. Reference Geotech recommendations for excavation and trenching

**1.02 DELIVERY AND STORAGE**

- A. Unload materials so as to avoid shock or damage. Handle and store all pipe in such a manner as to avoid deterioration or other injury thereto. Place no pipe within pipe of a larger size, except HDPE or PVC. Store pipe and fittings on sills above storm drainage level and delivery for laying after the trenches are excavated. Valves and hydrants shall be drained and stored to protect them from damage.

**1.03 APPLICABLE STANDARDS**

- A. All water main materials and workmanship shall be in accordance with applicable city or county Standard Specifications and Details.
- B. All sanitary sewer materials and workmanship shall be in accordance with applicable city or county Standard Specifications and Details

**PART 2 - PRODUCTS****2.01 MATERIALS**

- A. Extra Strength Vitrified Clay Pipe (ESVCP) shall conform to ASTM C-700 or as approved by authority having jurisdiction.
- B. Ductile Iron Pipe (DIP):
  - 1. Pipe shall conform to AWWA C151 Class 51, cement-lined in accordance with ANSI A21.4, except Class 52 minimum when threaded. Pipe ends shall be bell and spigot with mechanical joints that conform with ANSI A21.11 or with ends joined by a method that employs a single circular rubber gasket.
  - 2. Fittings 12 inch and smaller shall conform to ANSI A21.10, cement-lined in accordance with ANSI A21.4, Mechanical joint, spigot, or modified bell ends may be submitted in lieu of bell ends. Flanged ends are not acceptable.

**C. PolyVinylChloride (PVC):**

- 1. Water Lines
  - a. Pipe sizes 3 inch and larger which are installed below grade outside the building shall complying with AWWA C-900 Class 200 minimum and ASTM D-2241 rated SDR 21 Class 150. Pipe shall be continually marked with manufacturer's name, pipe size, cell classification, SDR rating, and ASTM classification. Pipe joints shall be integrally molded bell ends in accordance with ASTM D-3034 Table 2 with factory supplied elastomeric gaskets and lubricant.
- 2. Sewer Lines
  - a. Pipe and fittings shall comply with ASTM D-3034 rated SDR 35. Pipe shall be continually marked with manufacturer's name, pipe size, cell classification, SDR rating, and ASTM classification. Pipe joints shall be integrally molded bell ends in accordance with ASTM D-3034 Table 2 with factory supplied elastomeric gaskets and lubricant.
  - 3. Fittings shall conform to ANSI A21.10 gray-iron or ductile iron for use with PVC pipe and with mechanical joint ends. Couplings shall be Certainteed Corp. Fluid-Tite, Johns-Manville Ring-Tite, or approved equivalent.

**D. Chlorinated PolyVinylChloride (CPVC) Sewer Lines:**

- 1. Pipe and fittings shall comply with ASTM F-949. Pipe shall be continually marked with manufacturer's name, pipe size, cell classification, SDR rating, and ASTM classification. Pipe joints shall be integrally molded bell ends in accordance with ASTM Table 2 with factory supplied elastomeric gaskets and lubricant. Pipe shall be installed in accordance with manufacturer's recommendations. Pipe shall be Contech or approved equivalent.

**E. Corrugated Polyethylene Pipe (CPP) Smooth Interior:**

- 1. Only permitted when specifically indicated on the construction documents, conforming to AASHTO M294 and M252. Install for culvert and other heavy-duty drainage applications. Pipe shall be Advanced Drainage Systems N-12 WTIB or approved equivalent.

**2.02 VALVE AND ACCESSORIES**

- A. Gate valves shall be all-iron, bronze-mounted, double disc, parallel seats, non-rising stem with square operating nut turned

counter clockwise to open in accordance with AWWA C500 gate valve with non-rising stem, O-ring seals and 2 inch square operating nut; fire line underground gate valves shall be AWWA C509 with resilient gaskets.

- B. Check valves shall be swing check type, mounted horizontally, and shall have rubber or composition discs.
- C. Post indicator valves shall be either flanged end or have mechanical joint connections to pipeline. Must conform to FM and UL standards. Shall be of double revolving DISC. Underground valves shall have 2" square wrench nut. All parking lot post valves shall be provided with four (4) -6" bollards for traffic protection.

## 2.03 THRUST BLOCKS

- A. Blocks shall be concrete of a water/cement ratio of w/c=0.50 (max.) and shall have a compressive strength of not less than 2,000 psi at 28 days. Concrete for thrust blocks shall be placed against undisturbed earth.

## PART 3 - EXECUTION

### 3.01 EXISTING IMPROVEMENTS

- A. Maintain in operating condition all active utilities that serve areas adjacent to this project. Repair to the approval of the utility or authority having jurisdiction any surface or subsurface improvement damaged during the course of the Work, unless such improvement is shown to be abandoned or removed.

### 3.02 CONNECTIONS TO BUILDING PIPING

- A. The ends of sanitary sewers and water service lines shall be tightly plugged or capped 5'-0" outside of building walls, pending the connecting thereto of the building systems as specified in the plumbing section. Ends of lines shall be marked so they can be readily located.

### 3.03 TRENCHING AND BACKFILLING

- A. Provide trenching and backfilling for water service and sewerage pipes. Water and sewerage lines separation shall be minimum 10 feet horizontally and 18 inches vertically. Lay all piping in open trench except where Civil Engineer gives written permission for tunneling. Maintain access to fire hydrants by fire-fighting equipment.
- B. Excavate trenches of sufficient width for proper installation of the work. When the depth of backfill over sewer pipe exceeds 10 feet, keep the trench below the level of the top of the pipe as narrow as practicable.
- C. Sheet and brace trenches and remove water as necessary to fully protect workmen and adjacent facilities, in keeping with local regulations or, in the absence thereof, with the provisions of the "Manual of Accident Prevention in Construction", of the Associated General Contractors of America, Inc. Under no circumstances lay pipe or install appurtenances in water. Keep the trench free from water until pipe joint material has hardened. Sheeting left in place shall be cut off not less than 2 feet below finished grade. Sheeting shall not be removed until the trench is substantially backfilled.
- D. It shall be noted that excavation under this contract shall be unclassified.
- E. Grade the bottom of the trenches evenly to insure uniform bearing for full length of all pipes. Excavate all rock, cemented gravel, old masonry, or other hard material to at least 4 inches below the pipe at all points. Refill such space and all other cuts below grade with sand or fine gravel firmly compacted.
- F. Should soil conditions necessitate special supports for piping and/or appurtenances, including the removal of unsuitable material and refilling with gravel or other material such work shall be performed as necessary.
- G. Backfill trenches only after piping has been inspected, tested and the locations of pipe and appurtenances have been recorded. Backfill by hand around pipe and for a depth of 1 foot above the pipe. Use earth without rock fragments or large stones and tamps as specified in layers not exceeding 6 inches in thickness, taking care not to disturb the pipe or injure the pipe coating. Compact the remainder of the backfill as specified with a rammer of suitable weight or with an approved mechanical tamper, provided that under pavements, walks and other surfacing, the backfill shall be tamped as specified. Exclude all cinders, rubbish and scrap metal from trenches in which metal pipes are laid. Special care shall be used to properly tamp backfill under lower half of sewer pipe.
- H. Trenching through paved areas shall be isolated and protected with traffic rated structures. Use of steel plates, providing a concrete binder course or equivalent methods shall be used to cover the open trenches when work stops and/or waiting for asphalt pavement to be completed.



**3.04 SEWER CONSTRUCTION**

- A. Make all required connections to existing sewers. Carry out such work in accordance with local standards. Observe care to prevent debris from entering sewers. Check the invert elevations of existing sewers to which connections are to be made, and if appreciable difference from elevations noted on the drawings, or if they involve any difficulty in obtaining necessary drainage, notify the Civil Engineer immediately so that appropriate corrective action may be taken.
- B. Commence at the lowest point in the system and lay the pipe with the bell-end upgrade. Test pipe for soundness and clean interior and joint surfaces before lowering the pipe into the trench. Lay pipe in straight lines and on uniform grades between points where changes in alignment or grade are shown. Bed the pipe barrel uniformly.
- C. Comply fully with manufacturer's instructions for sewer pipe jointing, using sealing or lubricating compound as supplied by the manufacturer, and apply proper pressure to seal the spigot in the bell.
- D. As soon as the joint material has set, pack fine earth carefully around the joints, and around and over the pipe. Carry this backfill operation to a depth of at least 12 inches above the top of the pipe. Care shall be used in tamping backfill under lower parts of the pipe to give proper support, especially in shallow trenches.
- E. Flush all sanitary sewers, including building connections, with water in sufficient volume to obtain free flow through each line. Remove any obstructions and correct any defects discovered.

**3.05 WATER DISTRIBUTION SYSTEM INSTALLATION**

- A. Service line from existing main shall be furnished and installed to serve the project. The project contract work shall begin at indicated public water supply line and shall include all water lines, valves, fire hydrant and appurtenances as shown on the drawings, except as indicated otherwise.
- B. Pipe-Laying - General:
  - 1. The interior of all pipe shall be clean and joint surfaces wiped clean and dry before the pipe is lowered into trench. Lower each pipe, fitting and valve into the trench carefully and lay true to line and without objectionable breaks in grade. The depth of cover below finished grade shall be not less than 4'-0" and the standard cover shall be 5'-0".
  - 2. Provide uniform bearing for all pipes in trenches. Do not allow trench water or dirt to enter the pipe after laying. Insert a watertight plug in the open end of the piping while pipe laying is not in progress.
  - 3. Do not lay pipe closer than 10 feet to a sewer. At cross-overs with sewers, no joint in the water line shall be closer than 6 feet from the cross- over point. A minimum vertical distance of 18 inches between the outside of the water main and the outside of the sewer shall be maintained when the water main is either above or below the sewer. Provide valves, plugs or caps, as required, where pipe ends are left for future connections.
  - C. All pipe shall be laid with standard provisions for expansion and contraction and in accordance with manufacturer's recommendations. All pipe with slip type joints shall be restrained at elbows and tees by thrust blocks or rods and clamps.
  - D. Install suitable fittings at all changes in direction, dead ends and branch connections, provided that double strap saddles, in lieu of tees, may be used for service taps.
  - E. Copper pipe shall be joined by means of wrought copper, solder-joint fittings. Ends of pipe to be cut evenly, reamed and sanded sufficiently at ends for solder to make required contact. Insulated unions shall be installed in service lines at main.
  - F. Before setting each valve, make sure the interior is clean and test opening and closing. Set valves and stops with stems plumb and at the exact location shown. Provide brick laid flat or other similar foot-pieces under each curb box. Valve and service boxes shall be plumb, with tops at finished grade.

**3.06 CLEAN UP**

- A. Remove all scrap, trash, sediment and debris leaving all areas clean for other trades.

**END OF SECTION**

**PART 1 - GENERAL****1.01 DESCRIPTION OF WORK**

- A. The extent of pavement marking is shown on the drawings.
- B. Work includes, but is not limited to the following.
  - 1. Parking stall divider lines.
  - 2. Wheelchair legends.
  - 3. "Stop" legends.
  - 4. "No Parking" legends.
  - 5. Customer Pick-Up Zone striping and legends.
  - 7. Diagonal striping.
  - 8. Center line striping.
  - 9. Concrete Wheel Stops.
  - 10. Fire lane striping.

**1.02 RELATED DOCUMENTS**

- A. The General and Supplementary Conditions and General Requirements (Division 1) apply to work specified in this section.
- B. State Standard Specification for Road Construction, latest edition.

**1.03 QUALITY ASSURANCE**

- A. Provide pavement marking complete in every respect.
- B. Reference Standards: Comply with the current edition of applicable provisions of published codes and standards unless noted otherwise.
  - 1. ASTM D 93, D 562, D 711, D 821, D 1210, D 1475, D 1640, D 2243, D 2369, D 2486, D 3723, D 3960, E 70, and G 53.
  - 2. DOT Code of Federal Regulations, Hazardous Materials and Regulations Board, Reference 49CFR, ICC Regulations.
  - 3. State Standard Specification for Road Construction, latest edition.

**1.04 SUBMITTALS TO CONTRACTOR**

- A. Shop Drawings: Indicate sizes, shapes, patterns, and colors of marking, and manufacturers and types of paints.

**1.05 DELIVERY, STORAGE AND HOLDING**

- A. Deliver all materials to the job site with all labels intact and legible at time of installation.
- B. Store materials off ground under cover. Protect from damage or deterioration.
- C. Handle materials to prevent damage to surface, edges, ends and factory applied finishes of items. Damaged material shall be rejected and replaced.

**1.06 GUARANTEE**

- A. Contractor shall guarantee entire installation for one (1) year from date of Grand Opening.

**PART 2 - PRODUCTS****2.01 ACCEPTABLE MANUFACTURERS**

- A. Provide ready-mixed one component waterborne traffic line paint. Materials shall be 4800 Series Traffic Paint Water Reducible Acrylic from ICI Paints or equal.
  - a. Colors
    - 1. Yellow: 1 Gallon 20087 & 5 Gallon 20088
    - 2. White: 1 Gallon 25524 & 5 Gallon 22683
    - 3. Blue: 1 Gallon 20089 & 5 Gallon 20090
    - 4. Red: 1 Gallon 43613 & 5 Gallon 43614
    - 5. Black: 1 Gallon 26565 & 5 Gallon 26566
- B. Paints shall contain all necessary co-solvents, dispersants, wetting agents, preservatives and all other additives, so that paint shall retain viscosity. Halogenated solvents and glass beads shall not be permitted.
- C. Volatile Organic Compound (VOC) content shall not exceed 250 grams maximum per liter of paint as determined in accordance

with ASTM D 3960 test, excluding water and exempt solvents.

**PART 3 - EXECUTION****3.01 INSPECTION**

- A. Installer shall examine the substrates and conditions under which materials are to be installed, and notify the Civil Engineer in writing of conditions detrimental to the completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.
- B. Coordinate provisions for installation with work of other trades.
- C. All parking area marking and painting to be protected by appropriate traffic barriers, lighted if necessary, so located as to prohibit parking and traffic until the Civil Engineer gives permission for such.

**3.02 CLEANING**

- A. All surfaces shall be clean and in a condition to accept markings and paintings.

**3.03 INSTALLATION**

- A. Install pavement marking in accordance with approved shop drawings and applicable codes and standards.
- B. Traffic paint shall be installed in two coats. First Coat shall be installed at the recommended DFT after paving is in place (no later than turn over) with the second coat installed at the recommended DFT 30 days later (no later than 2 weeks before grand opening).
- C. Concrete wheel stops shall be painted on all sides with the exception of the underside of the base.
- D. Apply paint materials using clean brushes, rollers or spraying equipment.
- E. Apply materials at a rate not exceeding that recommended by paint manufacturer for surface being painted, less ten percent of losses.
- F. Comply with manufacturer's recommendations for drying time between coats.
- G. Where specified, the minimum dry film thickness must be met. Apply additional coats as needed to achieve minimum total specified dry film thickness of the Paint System.

**3.04 PAINTING**

- A. The Minimum Required total Dry Film Thickness (DFT): The DFT shall be the minimum required dry film thickness as measured in mils, or as required by sections 2.01 of this specification as well as part of the referenced standard in section 1.02 of the same.  
System Coverage Requirements:  
1st Coat - 3.0 mils DFT  
2nd Coat - 6.0 mils DFT
- B. Exterior Paint Systems: Provide the following paint systems as indicated:
  - 1. Parking stall, division and limit lines shall be 4" in width, true and straight. Color: White – DFT 6.0 mils.
  - 2. Pavement lettering "NO PARKING" shall be 2'-0" in height. Color: Red – DFT 6.0 mils.
  - 3. Compact lettering "COMPACT" shall be 1'-0" in height. Color: White – DFT 6.0 mils.
  - 4. Stop legends shall be as detailed on Drawing. Color: White - DFT 6.0 mils.
  - 5. Wheelchair legends shall be as detailed on Drawing. Color: Blue background with white symbols. Parking stall striping shall be Blue at Handicapped stalls only - DFT 6.0 mils.
  - 6. Diagonal striping Handicapped. Color: Blue - DFT 6.0 mils.
  - 7. Diagonal striping Loading Zone. Color: Yellow - DFT 6.0 mils.
  - 8. Directional signage shall be as detailed on Drawing. Color: White - DFT 6.0 mils.
  - 9. Centerline striping shall be 4" in width as detailed on Drawings. Color: White - DFT 6.0 mils.
  - 10. Concrete wheel stops. Color: Yellow - DFT 6.0 mils
  - 11. Fire Lane striping as required by code. Color Red Lines, White Letters – DFR 6.0 mils.

**4.01 COMPLETION**

- A. During the progress of the work, the premises shall be kept free of debris and waste resulting from the work in this section. Upon completion, all surplus material and debris shall be removed from the site.

**Construction Specification**

**PAVEMENT MARKINGS**

- B. At completion of work, touch up minor damage to prefinished surfaces to the satisfaction of the Civil Engineer. Replace materials damaged or stained during installation.

END OF SECTION

**PART 1 - GENERAL****1.01 DESCRIPTION OF WORK**

- A. Extent of storm drainage system work is shown on drawings.
- B. Storm drainage system work includes, but is not limited to, the following:
  - 1. Storm drainage conduits
  - 2. Manholes, frames and covers
  - 3. Catch basins, frames and gratings.
- C. Related work specified elsewhere:
  - 1. Section 01012 - Preferred Purchasing
  - 2. Section 02200 for excavation and backfilling required in connection with storm drainage system work.
  - 3. Section 03300 for concrete work required in connection with storm drainage work.

**1.02 PREFERRED PURCHASING**

- A. Unless noted otherwise, Contractor and all subcontractors are encouraged to purchase all products listed in this specification section from a local The Home Depot Store. For more information, refer to Section 01012.

**1.03 QUALITY ASSURANCE**

- A. Installer: A firm specializing and experienced in storm drainage work for not less than two years.
- B. Comply with standards and requirements of Florida Department of Transportation and other agencies having jurisdiction.

**1.04 SUBMITTALS TO CONTRACTOR**

- A. Product Data: Submit manufacturer's product data and installation instructions for each product specified for storm drainage system.

**PART 2 - PRODUCTS****2.01 CONDUIT MATERIALS**

- A. General: Furnish els, tees, reducing tees, wyes, couplings, increasers, crosses, transitions and end caps of same type and class of material as conduit, or of material having equal or superior physical and chemical properties as acceptable to the Architect of Record. Pipe materials shall be as specified on the Construction Plans.
- B. Reinforced Concrete Pipe: ANSI/ASTM C 76, Class as indicated, with modified tongue-and-groove compression gasket joints complying with ANSI/ASTM C443.
- C. Concrete Pipe: ANSI/ASTM C 14, Class 2, unless otherwise indicated.
- D. Vitrified Clay Pipe: ANSI/ASTM C 700, Extra Strength (XS) with resilient gasket joints complying with ANSI/ASTM C 425.
- E. Corrugated Polyethylene Pipe (PE): Pipe complying with AASHTO M252 Type S, M294 Type S, MP7 Type S, and ASTM D3350. Pipes shall be joined with gasketed bell and spigot joints complying with AASHTO M252, M294, MP7. Pipe shall be Advanced Drainage Systems N12 Pipe or Approved Equivalent. Gaskets shall comply with ASTM F477 and ASTM D1149. Provide minimum coverage per manufacturer's specifications.

**2.02 DRAINAGE STRUCTURES**

- A. General: Drainage Structures shall be of the size and type indicated on the construction plans. Installation of all drainage structures shall be in accordance with construction plans and specifications
- B. Concrete Base: Precast or cast-in-place, at Contractor's option. Use concrete, which will attain a 28-day compressive strength of not less than 3000 psi.
- C. Precast Concrete Manholes: ANSI/ASTM C 478, sized as indicated, eccentric cone precast top.
- D. Engineered Drainage Structures: Drain Basins, Inline Drains, and Curb Inlets
  - 1. Precast or cast-in-place concrete. Use concrete, which will attain a 28-day compressive strength of not less than 3000 psi. Precast structures shall conform to ANSI/ASTM C478, sized as indicated, eccentric cone precast top.
  - 2. Nyloplast or approved equivalent. Structures shall be from PVC pipe stock utilizing a thermo-molding process to obtain

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**Construction Specification**

Section 02721  
**STORM DRAINAGE SYSTEM**

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configuration. Structures shall have joints, which conform to ASTM D3212.

**2.03 MASONRY MATERIALS**

- A. Concrete Masonry Units: ANSI/ASTM C 139.
- B. Manhole Brick: ANSI/ASTM C 32, Grade MS.
- C. Sewer Brick: ANSI/ASTM C 32, Grade SS.
- D. Masonry Mortar: ANSI/ASTM C 270, Type M.

**2.04 METAL ACCESSORIES**

- A. Manhole Frames and Covers: Grey cast iron, ANSI/ASTM A 48, Class 30 B.
  - 1. Comply with requirements of FS RR-F-621 for type and style indicated.
  - 2. Furnish covers with cast-in legend on roadway face as indicated.
- B. Manhole Steps: Grey cast iron, ANSI/ASTM A 48, Class 30B, integrally cast into manhole sidewalls, unless otherwise indicated.
- C. Cast Basin and Engineered Drainage Structures Frames and Gratings: Grey cast iron, ANSI/ASTM A 48-83, Class 30 B or Ductile Iron, ASTM A536, Grade 70-50-05.
  - 1. Comply with requirements of FS RR-F-621, for type and style required.

**PART 3 - EXECUTION****3.01 EXAMINATION**

- A. Installer must examine the areas and conditions under which storm drainage system work is to be installed and notify the General Contractor in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

**3.02 INSTALLATION OF CONDUIT**

- A. Install conduit in accordance with governing authorities having jurisdiction, except where more stringent requirements are indicated.
- B. Inspect conduit before installation to detect apparent defects. Mark defective materials with white paint and promptly remove from site.
- C. Lay conduit beginning at low point of a system, true to grades and alignment indicated with unbroken continuity of invert.
- D. Place bell ends of corrugated polyethylene conduit, clay conduit or groove end of concrete conduit facing upstream.
- E. Install gaskets in accordance with manufacturer's recommendations for use of lubricants, cements, and other special installation requirements.
- F. Corrugated Polyethylene Pipe: Install in accordance with Advanced Drainage Systems Product Note 3.115 "Installing N-12 Storm, Sanitary Sewer, and Culvert Pipe.
- G. Concrete Pipe: Install in accordance with applicable provisions of American Concrete Pipe Association "Concrete Pipe Field Manual", unless otherwise indicated.
- H. Vitrified Clay Pipe: Install in accordance with applicable provisions of ASTM C 12, Recommended Practice for Installing Clay Sewer Pipe, unless otherwise indicated.
- I. Cleaning Conduit: Clear interior of conduit of dirt and other superfluous material as work progresses. Maintain swab or drag on line and pull past each joint as it is completed.
  - 1. Place plugs in ends of uncompleted conduit at end of day or whenever work stops.
  - 2. Flush lines between manholes if required to remove collected debris.
- J. Interior Inspection: Inspect conduit to determine whether line displacement or other damage has occurred.
  - 1. Make inspections after lines between manholes, or manhole locations, have been installed and approximately two feet of backfill is in place and at completion of project.
  - 2. If inspection indicates poor alignment, debris, displaced pipe, infiltration or other defects, correct such defects to

satisfaction of the Architect of Record.

**3.03 UNDERGROUND STRUCTURES**

- A. Precast Concrete Manholes: Place precast concrete sections as shown on drawings. Where manholes occur in pavement, set tops of frames and covers flush with finish surface. Elsewhere, set tops 3" above finish surface, unless otherwise indicated.
1. Use epoxy bonding compound where manhole steps are mortared into manhole walls.
  2. Provide rubber joint gasket complying with ASTM C 443.

- B. Catch Basins and Engineered Drainage Structures: Construct catch basins, Drain basins, Curb Inlets, and inline drains to the sizes and shapes indicated.

1. Use concrete, which will attain a 28-day compressive strength of not less than 3000 psi.
2. Set cast-iron or ductile iron frames and gratings to elevations indicated.

**3.04 TAP CONNECTIONS**

- A. Make connections to existing conduits and underground structures, so that finished work will conform as nearly as practicable to requirements specified for new work.

- B. Take care while making tap connections to prevent concrete or debris from entering existing conduit or structure. Remove debris, concrete or other extraneous material, which may accumulate.

**3.05 BACKFILLING**

- A. General: Conduct backfill operations of open-cut trenches closely following laying, jointing and bedding of pipe, and after initial inspection and testing are completed.

**3.06 TESTING**

- A. Perform testing of completed conduit lines in accordance with local authorities having jurisdiction.

END OF SECTION

**Construction Specification     FINE GRADING, TEMPORARY GRASSING AND EROSION CONTROL****PART 1 - GENERAL****1.01     DESCRIPTION**

- A. This Section of the Specifications and related drawings describes requirements pertaining to finish grading and temporary grassing work.
- B. Related work specified elsewhere:
  - 1. Section 02200 - Earthwork
  - 2. Section 02920 - Soil Preparation
  - 3. Section 02930 - Lawns and Sod
  - 4. Section 02940 - Landscape Planting
  - 5. Section 02950 - Trees, Shrubs, Vines and Groundcovers
  - 6. Section 02960 - Landscape Irrigation

**1.02     STANDARDS**

- A. Grass seed shall conform to tolerances for germination and purity in accordance with applicable standards of U.S. Department of Agriculture.
- B. Availability of various elements contained in all fertilizers shall conform to standards of the Association of Official Agricultural Chemists.

**PART 2 - PRODUCTS****2.01     TOPSOIL**

- A. All topsoil necessary to complete the work shall be obtained from topsoil stockpiles from grading and excavating operations and from approved topsoil sources on the site. In the event additional topsoil is required, it shall be obtained from approved sources off the site. Topsoil shall be natural, friable, topsoil characteristic of representative soils in the vicinity that produce heavy growths of crops, grass, or other vegetation. Topsoil shall be free from tree roots, stones, and other materials that hinder grading, planting, and maintenance operations, and free from noxious and other objectionable weed seeds and toxic substances.
- B. Topsoil borrow areas used on the site shall be neatly trimmed, drained and grassed after borrow excavations are completed.
- C. At Contractor's expense, an accurate representative sample of topsoil shall be analyzed by a reputable laboratory. The soil test shall report on PH and nutrient levels referencing the best methods to create a soil makeup using soil neutralizers, growth stimulants, fertilizers, and or enhancers for the specified grass seed to germinate and grow. Contractor shall compare the mix design to the planned mix design and submit any modifications with the soil test to The Home Depot Project Manager for approval or rejection.

**2.02     FERTILIZER**

- A. Provide a commercial grade fertilizer manufactured in accordance with the recommendations of the State Agricultural Board.
- B. Fertilizer shall be a grade containing the appropriate plant food elements as determined by the soil test.
- C. Deliver the acceptable fertilizer in standard size bags, showing weight, analysis, and manufacturer's name. Store in a weatherproof storage place in such manner that its effectiveness will not be impaired.

**2.03     GROUND LIMESTONE**

- A. Ground limestone (calcium carbonate) shall have the following analysis: at least 95 percent to pass 20 mesh sieve; at least 55 percent to pass 60 mesh sieve; and at least 40 percent to pass 100 mesh sieve.
- B. Total carbonates shall be not less than 80 percent of 44.8 percent calcium oxide equivalent; for purpose of calculation total carbonates are considered as calcium carbonate.

**2.04     SOIL NEUTRALIZERS – GROWTH STIMULANTS AND ENHANCERS**

- A. Fast-response liming source must be hydraulically applied with a Hydroseeder during the hydraulic seeding process. Quantity applied will be determined by the soil test. Products: Neutralime or equivalent.
- B. Fast response acidifier must be hydraulically applied, with a Hydroseeder prior to the hydraulic seeding process. Quantity applied will be determined by the soil test. Products: Aqua-pHix or equivalent.
- C. Fast response liquid organic modifier must be hydraulically applied, with a Hydroseeder prior to the hydraulic seeding process. Quantity applied will be determined by the soil test. Products: JumpStart or equivalent. Do not mix modifier and acidifier together.



**Construction Specification      FINE GRADING, TEMPORARY GRASSING AND EROSION CONTROL**

- D. Bio-stimulant designed to address issues affecting long-term plant vitality must be hydraulically applied, with a Hydroseeder prior to the hydraulic seeding process. Quantity applied will be determined by the soil test. Products: BioPrime or equivalent.

**2.05      MULCH**

- A. Mulch shall be baled wheat, oat, rye, or hay or other grasses as acceptable to the Architect of Record and shall be applied on all areas to be seeded unless they are hydroseeded. Mulch shall be applied at a rate of 1-1/2 to 2 tons per acre and shall be anchored to the soil to prevent it from being blown around on the site during periods of high winds. Asphalt emulsion application will not be acceptable. At any time, the mulch becomes bunched it shall be respread and reanchored.

**2.06      HYDROMULCH**

- A. Hydromulch shall be composed of wood cellulose fiber and contain no germination- or growth-inhibiting factors. It shall be colored green to allow visual metering in its application and have the property of being evenly dispersed and suspended when agitated in water.

**PART 3 - EXECUTION****3.01      DEPOSITING, SPREADING AND PREPARATION OF TOPSOIL AREAS**

- A. Do not start work until after construction work on structures, walks, curbs, walls and paved areas has been substantially completed, and rough grading has been completed, inspected and accepted. The grassing work shall be accomplished only when satisfactory results can be expected. When conditions such as drought, excessive moisture, high winds, or other factors prevail to such an extent that satisfactory results are not likely to be obtained the work shall be stopped. The work shall be resumed only when the desired results are likely to be obtained. All grassing operations shall be conducted across the slope. Establishment of grass shall be as specified.
- B. Prior to spreading topsoil the subgrade shall be pulverized to a minimum depth of two inches with equipment capable of obtaining proper pulverization of the soil.
- C. Topsoil shall be uniformly distributed and evenly spread to a minimum thickness of 4 inches. Topsoil shall be spread so that planting can proceed with little additional soil preparation or tillage.
- D. Any finished grade that is not free from lumps and foreign material as described in Paragraph 2.01 will not be acceptable.
- E. After placement, finish grade topsoil to levels, grades and contours as shown. Maintain surfaces to indicated finished grades. Deposit whatever additional topsoil may be required to take care of any settlement or erosion up to date of final acceptance. Rake surfaces upon which additional topsoil is to be deposited or otherwise prepare to insure proper bond.
- F. The General Contractor is responsible for final grades on the site.
- G. Till in order to provide a good seed bed. Hand tools such as a lawn rake, grading rake, steel line speed rake, potato hook or spiker aerator or mechanical equipment such as a verticutter, disc harrow, scarifier-rake, tine harrow, etc., shall be used during cultivation operations.
- H. These tools and equipment plus any other that the Contractor desires to use shall be employed during spreading of smooth draining grades and a fine graded surface upon which to receive seed.

**3.02      AREAS AND TYPE OF GRASS**

- A. Within the time period set by the governing agencies, areas of exposed soils being undisturbed or disturbed areas being left idle during construction shall get temporary or permanent stabilization.
- B. Type of seed to be used based on region project is in. This shall be the grass seed specification used in the bid unless the plans specify different.
1. Florida Region
- a. Warm Season: Browntop/German Millet - 50 lb/ac
- b. Cool Season: Annual Ryegrass/Rye Grain - 50 lb/ac

**3.03      SLOPE AND DITCH TREATMENT**

- A. Crown vetch shall be planted on slope in excess of one vertical to three horizontal. Seed mix shall be K-31 tall fescue at 40 pounds per acre and crown vetch at 20 pound per acre. Inoculate seed with fresh inoculants as directed on package. Insure that crown vetch inoculants contains sticker supplement. Maintain temperature of between 50° and 75° during inoculation. When hydro seeding, use five times inoculants rate.

**3.04      LIMESTONE APPLICATION**

- A. Apply ground limestone (at a rate as determined by the soil test) and thoroughly incorporate into the top 4 inches of soil.

**Construction Specification     FINE GRADING, TEMPORARY GRASSING AND EROSION CONTROL****3.05     FERTILIZER APPLICATION**

- A. Apply fertilizer at a rate as determined by the soil test.
- B. Rework soil to remove all foreign matter and lumps as specified in preparation of topsoil areas.

**3.06     HYDROSEEDING**

- A. Hydrosseed shall be applied with hydraulic equipment at the rate of 2,000 lbs/acre for slopes less than 4:1, 2,500 lbs/acre for slopes between 4:1 to 3:1, 3,000 lbs/acre for slopes between 3:1 to 2:1, and 3,500 lbs/acre for greater than 2:1 slopes. Hydromulch shall be added to the water slurry in the hydraulic seeder after the proportionate quantities of seed, fertilizer and other accepted materials have been added.

- B. The slurry shall be sprayed uniformly on the surface of the soil.

**3.07     TEMPORARY LAWNS**

- A. Seed mix as specified on plan or if not specified apply 80% Tall Fescue with 20% Annual Rygrass (Lolium Multiflorum) at 250 lb/acre added to water slurry.

- B. The temporary lawns shall be maintained by the Contractor until the preparation for permanent lawn is started.

**3.08     SMOOTHING ALL LAWNS**

- A. If the lawn surface has become bumpy and uneven during planting or because of washing during a heavy rain, begin smoothing operations at the time of first mowing. Apply topsoil to low spots in the lawn in light applications (up to 1/2 inch deep) to produce a smooth surface.

**3.09     MAINTENANCE**

- A. Provide maintenance from start of work until Grand Opening. Maintenance includes watering of lawns, re-fertilization, weeding, mowing, cleaning up and edging, repairs of all washouts and gullies, repairs or protection, and other necessary work of maintenance. Maintain slopes against erosion.

**3.10     EROSION**

- A. Contractor shall anticipate a certain amount of erosion after completion of grassing and he shall continue to re-prepare, add topsoil, re-fertilize, and re-plant eroded areas using sod, or hydromulch in areas where erosion persists, until the grass is acceptable in all respects.

**3.11     MOWING**

- A. Mowing shall be accomplished with acceptable mowing machines as often as necessary in accordance with good turf establishment practices.

**3.12     WATERING**

- A. During establishment, grassed areas shall be moist through the upper 4 inches of soil.

**3.13     CLEANUP**

- A. Before inspection of work, and before acceptance, paved areas that are soiled or stained by operations of work of this Section shall be cleaned. Clean by sweeping or washing and remove all detachments or stains.

- B. At the completion of work from this Section, the Contractor shall remove construction equipment, excess materials and tools. Cart away from site any debris resultant from work of this Section and dispose in a legal manner off the Owner's property.

**3.14     INSPECTION AND ACCEPTANCE**

- A. The Contractor shall, after his personal inspection, request an acceptance inspection by the Architect of Record and The Home Depot Project Manager.

- B. After acceptance, maintenance will be assumed by the Owner or his designated representative.

**3.15     CONDITION UPON ACCEPTANCE**

- A. No erosion shall exist.

- B. Thin grass spots in excess of 5 percent or any exposed soil area on the property will not be acceptable.

**Construction Specification**    **FINE GRADING, TEMPORARY GRASSING AND EROSION CONTROL**

END OF SECTION

**PART 1 - GENERAL****1.01 DESCRIPTION**

- A. General: Provide soil preparation in accordance with the contract documents.
- B. Related Work Specified Elsewhere:
  - 1. Section 02810 -Finish Grading.
  - 2. Section 02930 –Lawn and Sod
  - 3. Section 02950 - Trees, Shrubs, Vines, and Groundcovers.

**1.02 PROJECT/SITE CONDITIONS**

- A. Review the Owner's existing soils analysis and soils boring data.

- B. Existing conditions: For protection of existing plants to remain, refer to spec. Section - Trees, Shrubs, Vines and Groundcover.

**1.03 EXAMINATION OF SITE AND DOCUMENTS**

- A. By submitting a bid, the Contractor affirms that he has carefully examined the site and all conditions affecting work under this Section. No claim for additional costs will be allowed because of lack of full knowledge of existing conditions.
- B. Plans, specifications, surveys, measurements, other documents and dimensions under which the work is to be performed are believed to be correct, but the Contractor shall have examined them for himself during the Bidding period, as no additional compensation will be made for errors or inaccuracies that may be found therein.

**1.04 SEQUENCING AND SCHEDULING**

- A. Do not install on-structure drainage materials or soil mix prior to acceptance of waterproofing and sprinkler irrigation in other sections.

**1.05 SUBMITTALS TO CIVIL ENGINEER**

- A. Product Data: Manufacturer's current catalog cuts and specifications of the following:
  - 1. Fertilizer.
  - 2. Approved amendment.
  - 3. Peat moss.
  - 4. Pottng soil.
- B. Quality Control Submittals:
  - 1. Soils Test Lab:
    - a. Soils Testing Laboratories:
      - i. To be approved by the Owner.
      - ii. Lab must be capable of providing field observation and testing services as well as experience in landscape soils, fertilizers, soil neutralizers, growth stimulants and enhancers.
  - 2. Test Reports:
    - a. Organic Amendments: Test for physical and chemical properties.
    - b. Imported Topsoil: Agricultural suitability tests.
    - c. Stockpiled on Site Natural Topsoil.
      - i. Agricultural suitability tests.
    - d. Off-Site Imported Topsoil.
      - i. Agricultural suitability tests.
    - e. On-Site Earth Subsoil in Planted Areas:
      - i. Agricultural suitability tests.
    - ii. Certificates: Contractor certifying strict compliance with accepted soil mixes and amendments, including rate of application.

**1.06 FIELD QUALITY CONTROL**

- A. Tests: Right is reserved to take soil mixes and prepared soil for testing for conformity to Specifications.
- B. Rejected Materials: The contractor shall pay cost of testing of materials not meeting specifications.

**PART 2 - PRODUCTS****2.01 MATERIALS**

- A. Stockpiled On Site Native Topsoil:

1. Quantity: The approximate quantity of on site stockpiled native soil will not be known until demolition and excavation for parking lots and building pads have been completed.
2. Topsoil shall have been stockpiled on the site under Site Earthwork section. Provide agricultural suitability test.
3. Amend topsoil per recommendation of soil test for the trees, shrubs, groundcover and perennials as noted on the drawings and for the lawns.

B. Off-Site Imported Topsoil:

1. Composition: Fertile, friable, well-drained soil, of uniform quality, free of stones over 1 in. diameter, sticks, oils, chemicals, plaster, concrete and other deleterious materials.
2. Analysis: Obtain an agricultural suitability analysis of the proposed topsoil from an approved Soils Testing Laboratory.
3. Test Results: Request soils laboratory to send one (1) copy of test results direct to the Landscape Architect and The Home Depot Project Manager.
  - a. Imported topsoil shall be amended per soils test report for the trees, shrubs, groundcovers, and perennials, as noted on the drawings and for the lawns.
4. Samples: The Landscape Architect reserves the right to take samples of the imported topsoil delivered to the site for conformance to the Specifications.
5. Rejected Topsoil: Immediately remove rejected topsoil off the site at Contractor's expense.

2.02 AMENDED TOPSOIL

- A. Soil Amendments: Incorporate thoroughly with top six (6) in. of lawn and planting areas per 1,000 square feet:
- 6 cu. yd. Approved Organic Amendment  
30 lbs. 6-20-20 Commercial Fertilizer  
50 lbs. Dololite Lime  
10 lbs. Iron Sulfate  
Prescriptive Agronomic Formulations (PAF's)

Intent: The above amendments and quantities are approximate and are for bidding purposes only following an on-site topsoil analysis by Soils and Plant Laboratory, composition of amendments may change. Contract price will be adjusted accordingly.

B. Organic Amendments:

1. Type: As recommended by the soils laboratory.

2.03 BACKFILL MIX

- A. Backfill mix shall be composed of approved topsoils amended and fertilized per the recommendations of the soils laboratory.

2.04 COMMERCIAL FERTILIZERS

- A. Controlled Release Fertilizer:
1. Type: Osmocote 17-6-12 plus minors.

2.05 SUPPLEMENTAL CHEMICAL COMPONENTS:

- A. The following but not limited to chemical components may or may not be used depending on the outcome of the solids agricultural suitability test.
- B. Dolomite Lime: Agricultural grade mineral soil conditioner containing 35% minimum magnesium carbonate and 49% minimum calcium carbonate, 100% passing #65 sieve. "Kaiser Dolomite 65 AG" as manufactured by Kaiser, Inc. Mineral Products Department or equal.
- C. Iron Sulfate (Ferric or Ferrous): Supplied by a commercial fertilizer supplier, containing 20% Fe as ferrous sulfate.
- D. Single Superphosphate: Commercial product containing 20% to 25% available phosphoric acid.
- E. Potassium Nitrate: Commercial product: 13-0-44.
- F. Calcium Nitrate: Agricultural grade containing 15-1/2% nitrogen.
- 2.06 WATER
- A. Water: Clean, fresh and potable. Furnished and paid for by Contractor. Transport as required.
- 2.07 SOIL
- A. Well Drained: High organic soil approved by landscape architects.

PART 3 - EXECUTION

**3.01 PREPARATION**

- A. Soil Moisture Content: Do not work soil when moisture content is so great that excessive compaction will occur, nor when it is so dry that dust will form in air or that clods will not break readily. Apply water, if necessary, to bring soil to optimum moisture content for tilling and planting. Maintain within 2 percent above or below optimum moisture content at all times during the work.
- B. Clearing of Debris: Clear all planting areas of stones 2 in. diameter and larger, weeds, debris and other extraneous materials prior to amending existing soil and prior to spreading topsoil.
- C. Preparation of Areas to Receive Topsoil:
  - 1. Verifications: Verify that subgrades for installation of topsoil have been established.
  - 2. Depth: Verify that subgrades are 6 in. minimum below finished grades, +/- 1 in., allowing for topsoil and soil amendments.
  - 3. Cultivation: Cross rip to 8" depth subgrade in planting areas prior to spreading topsoil.

**3.02 INSTALLATION OF AMENDED TOPSOIL**

- A. Installation of Amended Topsoil:
  - 1. Spreading of Topsoil:
    - a. Preparation: Do not commence spreading of topsoil prior to acceptance of soil preparation. Do not place topsoil under muddy or frozen conditions.
    - b. Topsoil Depth: Minimum depth of 6 in. after natural settlement and light rolling conforming to finished grades shown on Drawings.
    - c. Installation of Topsoil:
      - i. Install where shown on the Drawings.
      - ii. Place in 2 lifts of 3" per lift.
      - iii. First lift to be thoroughly mixed with subsoil by rototill, disc, or crossripping.
      - iv. Second lift to be placed on first and rototilled with amendments required by soils lab.

**3.03 PREPARATION OF BACKFILL MIX**

- A. Backfill mix shall be composed of approved topsoils amended and fertilized per the recommendations of the soils reports.

**3.04 PREPARATION OF AMENDED TOPSOIL**

- A. Amend the topsoil as specified Part 2.02A materials - amended topsoil preparation.

**3.05 APPLICATION OF PRE-EMERGENT HERBICIDE**

- A. Apply pre-emergent weed control to all areas to receive woody, non-lawn ornamental planting after incorporating soil amendments.
- B. Apply strictly according to manufacturer's current printed specifications.

**3.06 INSTALLATION OF BACKFILL MIX**

- A. Install where shown on the drawings and details and as specified under the Trees, Shrubs, Vines and Groundcover Section.

**END OF SECTION**

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**Construction Specification**

Section 02930  
**LAWN AND SOD**

**PART 1 - GENERAL****1.01 DESCRIPTION**

- A. General: Provide lawns and sod in accordance with the contract documents.
  - B. Related Work Specified Elsewhere:
    - 1. Section 02810 - Temporary Grassing and Erosion Control
    - 2. Section 02920 - Soil Preparation
    - 3. Section 02930 - Lawns and Sod
    - 4. Section 02940 - Landscape Planting
    - 5. Section 02950 - Trees, Shrubs, Vines and Groundcovers
    - 6. Section 02960 - Landscape Irrigation
- 1.02 REFERENCES**
- A. Hortus III - 1976 Edition, Bailey Horatorium, Cornell University.
  - B. Technical Association of the Pulp and Paper Industry for Wood Cellulose.
  - C. Florida Grades and Standards for Nursery Plants, 2015

**1.03 EXAMINATION OF SITE AND DOCUMENTS**

- A. By submitting a bid the Contractor affirms that he has carefully examined the site and all conditions affecting work under this Section. No claim for additional costs will be allowed because of lack of full knowledge of existing conditions.
- B. Plans, specifications, surveys, measurements, other documents and dimensions under which the work is to be performed are believed to be correct, but the Contractor shall have examined them for himself during the Bidding period, as no additional compensation will be made for errors for inaccuracies that may be found therein.

**1.04 SUBMITTALS TO CONTRACTOR**

- A. Product Data: Manufacturer's current catalog cuts and specifications of the following:
  - 1. Fertilizer, Neutralizer, Growth stimulants, and Enhancers
  - 2. Mulch
  - 3. Topsoil Mix
- B. Certificates:
  - 1. Certificates of inspection as required by law for transportation of each shipment of seed and sod along with invoice.
  - 2. Seed mix certificate including fertilizer and amendments and their rate of application.

**1.05 FIELD QUALITY CONTROL**

- A. Tests: Samples of materials may be taken and tested for conformity to Specifications at any time.
- B. Rejected Materials: Remove rejected materials immediately from the site at contractor's expense. Pay cost of testing of materials not meeting Specifications.

**1.06 DELIVERY, STORAGE AND HANDLING**

- A. Seed:
  - 1. Delivery: Furnish standard seed in unopened manufacturer's standard containers bearing quantity, analysis and name of manufacturer
  - 2. Storage: Store seed with protection from weather or other conditions, which would damage or impair the effectiveness of the product.
  - 3. Type of grass to be used is based on region project is in. This following list shall be the grass specification used within the bid unless the plans specify different.
    - a. Florida Region
      - i. Permanent Turf Areas (Maintained):
        - a). 3 way turf type bermuda blend – 75 lb/ac (or)
        - b). Bahia Grass (Pensacola) – 75 lb/ac
      - ii. Permanent Slope Areas (non-native grass species):
        - a). Mixture: Unhulled/Hulled Bermuda, Pensacola Bahia, Weeping Lovegrass, White Clover – 75lb/ac

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**Construction Specification**

Section 02930  
**LAWN AND SOD**

- B. Sod:
    - 1. Harvest and Delivery: Harvest from the source and deliver to project site within 24 hours. Deliver only as much sod as can be installed in one day's work.
    - 2. Review: Sod not transplanted within this time period shall be reviewed prior to installation.
    - 3. Type of sod to be used is based on region project is in. The turf type is specified in the seed section of this specification or more specifically described on the plans.
  - C. Mulch:
    - 1. Labeling: Each package of the cellulose fiber shall be marked by the manufacturer to show the air dry weight content.
    - 2. Storage: Store seed with protection from weather or other conditions, which would damage or impair the effectiveness of the product.
  - D. Fertilizer and amendments clearly labeled and stored in a containment area protected from weather and other conditions.
- 1.07 PROJECT/SITE CONDITIONS**
- A. Existing Conditions: For protection of existing plants to remain, refer to Spec. Section - Trees, Shrubs, Vines and Groundcover.
- 1.08 SEQUENCING AND SCHEDULING**
- A. Areas to Receive Hydroseeding: All graded, irrigation areas as delineated on the Drawings.
  - B. Period of Application of Hydroseeding:
    - 1. Irrigated Areas: Within fourteen (14) calendar days after the completion of finish grading in any area.
  - C. Scheduling:
    - 1. Immediately after finish grading and irrigation installation except for seasonal limitations. Hydroseeding shall be performed on a section by section basis. Each section area is based on the slurry tank size and the area that amount of slurry will cover. Prior to the operation of hydroseeding the foreman shall mark each section area on a site plan. Upon creating the slurry mix for each section the foreman shall mark on the site plan with the numbers of product bags used, with date and time slurry was mixed. Labels (single ID labels, codes, or SKU tags) cut off each bag of product of the slurry mix shall be collected and given to the ITC for verification prior to that section being covered.
      - a. Season: Plant in Fall or Spring.
      - 1. Allow sufficient time for full germination and 2 mowings before preliminary acceptance.
      - 2. Embankment and Slopes: Complete in a continuous manner.
      - 3. Hydromulch permanent cover application minimum rates: applied with hydraulic equipment at the rate of 2,500 lbs/acre for slopes less than 4:1, 3,500 lbs/acre for slopes between 4:1 to 3:1, 3,300 lbs/acre for slopes between 3:1 to 2:1, and 4,000 lbs/acre for greater than 2:1 slopes.
- 1.09 WARRANTY**
- A. The 90 day maintenance period begins the date of the Grand Opening of the store. The warranty period begins after the final acceptance of the maintenance period. The final acceptance occurs upon satisfactory completion of all work, included in the 90 day maintenance period, but exclusive of replacement of materials under the Warranty Period.
  - B. Time Period: Warrant that lawns and sod shall be in a healthy and flourishing condition of active growth one (1) year from date of Grand Opening.
  - C. Appearance During Warranty: Lawns and sod shall be free of dead or dying patches, and all areas shall show foliage of a normal density, size and color.
  - D. Delays: Delays caused by the Contractor in completing planting operations, which extend the planting into more than one planting season, shall extend the Warranty Period correspondingly.
  - E. Coverage: Warrant growth and coverage of hydroseeded planting to the effect that a minimum of 95% of area shall be covered with specified planting after one growing season with no bare spots.
  - F. Exceptions: Contractor shall not be held responsible for failures due to neglect by owner, vandalism, etc., during Warranty Period. Report such conditions in writing.
- PART 2 - PRODUCTS**
- 2.01 MANUFACTURERS/GROWERS**
- A. Lawn Sod: Grower is contractor's option.



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**Construction Specification**

Section 02930  
**LAWN AND SOD**

**B. Hydro Mulch and Soil Stabilizer:**

Conwed Fibers (a division of Profile Products)  
750 Lake Cook Rd, Suite 440  
Buffalo Grove, IL 60089  
Contact: Mary Beth Fletcher  
Phone: 1-800-366-1180

**C. Fertilizer:**

1. Regular Type: Nitrogen content derived from organic sources; bearing manufacturer's statement of analysis. Minimum requirements: 12% nitrogen, 4% phosphoric acid, 8% potash.
2. Slow-release Type: 50% of nitrogen is in slow-release form; content derived from organic or inorganic sources; bearing manufacturer's statement of analysis. Minimum requirements: 12% nitrogen, 4% phosphoric acid, 8% potash.
3. Commercial Mixed Type: Nitrogen content derived from organic or inorganic sources; bearing manufacturer's statement of analysis. Minimum requirements: 10% nitrogen, 10% phosphoric acid, 10% potash.

**D. Lime:** Ground limestone containing not less than 85% carbonates; 50% passing 100 mesh sieve and 90% passing 20 mesh sieve.

**E. Straw Bales:** Clean bales of straw of hay, wheat, rye, oats or barley.

**F. Hydromulch:** Wood cellulose fiber containing no germination inhibiting or growth inhibiting agents. Characteristics shall be as follows:

1. Percent moisture content: 9.0% (+3.0%)
2. Percent organic matter: 99.2% (+0.8).
3. Percent ash content: 0.8% (+0.2%).
4. pH: 4.8 (+0.5).
5. Water Holding Capacity: 1150 grams water/100 grams fiber, minimum.

**G. Mulch:** Clean, seed free straw of hay, wheat, rye, oats or barley.

**H. Staking Pegs:** 3/4" diameter by 8" long softwood.

**I. Water:** Clean, potable.

**2.02 ACCESSORIES**

**A. Mulch:** Shall be Product: "Silva Fiber", "X-100 Spra-mulch", "Conwed", Terra-Matrix SMM, or Flexterra FGM. Equivalents shall need approval through The Home Depot Project Manager.

1. Composition: Green-colored, fibrous, 100% virgin wood fibre mulch containing no growth or germination-inhibiting factors.
2. Weight: Weight specifications of this material from suppliers, and for all applications, shall refer only to air dry weight of the fiber material. Absolute air dry weight is based on the normal standards for wood cellulose and is considered equivalent to 10% moisture.
3. Dispersion in Slurry: Mulch shall be manufactured in such manner that after addition to and agitation in slurry tanks with fertilizer, seed, water and other approved additives, fibers in the material will become uniformly suspended to form a homogeneous slurry.
4. Absorption Capacity: When hydraulically sprayed on the ground, the material will form a blotter-like groundcover impregnated uniformly with seed, which will allow absorption of moisture and allow rainfall to percolate to the underlying soil.

**2.03 HYDROSEED EQUIPMENT (if required)**

**A. Type:** Commercial type hydro-seeder for the application of slurry. Equipment shall have a built-in agitation system with an operating capacity sufficient to agitate, suspend and homogeneously mix slurry.

**B. Distribution Lines:** Large enough to prevent stoppage and to provide even distribution of the slurry over the ground.

**C. Pump Capacity:** 150 psi at the nozzle.

**D. Slurry-Tank:** Minimum capacity of 1,000 gallons and shall be mounted on a travelling unit which will place the slurry tank and spray nozzles within sufficient proximity to the areas to be seeded.

**2.04 MIXES**

**A. Hydroseeding Mix per (1,000 Sq. Ft.).** Contractor shall obtain mix design from the plans or if not stated from the soil test

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## **Construction Specification**

Section 02930  
**LAWN AND SOD**

recommendations.

1. Lawn Areas:
  - a. 30 lbs. - Mulch
  - b. 7 lbs. - Lawn Seed
  - c. 10 lbs. - Fertilizer and Amendments.
  - d. Mix quantities can change based on the plan design mix and the soils test recommendations. Contractor shall apply the required quantities without additional charge to The Home Depot.

### **PART 1 - EXECUTION**

#### **1.01 EXAMINATION**

##### **A. Verification of Conditions:**

1. Stones, Weeds, Debris: Verify that all areas to receive hydroseeding and sodding are clear of stones larger than 1/2 in. diameter, weeds, debris and other extraneous materials.
2. Grades: Verify that grades are within 1 in. plus or minus of the required finished grades. Verify that fertilization have been installed in another section. Report all variations in writing.

#### **1.02 PREPARATION**

##### **A. Soil Moisture:**

1. Excessive Moisture: Do not commence work of this section when soil moisture content is so great that excessive compaction will occur, nor when it is so dry that dust will form in air or that clods will not break readily.
2. Inadequate Moisture: Apply water, as necessary, to bring soil moisture content to an acceptable level.

#### **1.03 HYDROSEEDDED LAWN**

##### **A. Preparation: Do all slurry preparation at the job site.**

1. Water: Add water to the tank when the engine is at half throttle. When the water level has reached the height of the agitator shaft, establish good re-circulation and add seed.
2. Seed: Do not allow seed to remain more than 30 min. in slurry.
3. Fertilizer: Add fertilizer, followed by the mulch. The mulch shall only be added to the mixture after the seed, and when the tank is at least 1/3 filled with water.
4. Mixing: Open the engine throttle to full speed when the tank is half-filled with water. Add all the mulch by the time the tank is 2/3 to 3/4 full. Commence spraying immediately when the tank is full.

##### **B. Seed Bed Preparation:**

1. Rolling: Roll amended soil with 200 pound water ballast roller and bring to finish grade.
2. Raking: Lightly rake seed bed surface to 1/4 in. depth. Seed immediately thereafter, provided the seed bed has remained in friable condition.

##### **C. Application:**

1. General: Apply specified slurry mix in a sweeping motion to form a uniform mat at the specified rate. Keep hydroseeding within designated areas and keep from contact with other plant materials.
2. Unused Mix: Do not use a slurry mixture, which has not been applied within 4 hours of mixing. Promptly remove from the site.
3. Protection: After application, do not operate any equipment over the hydroseeded areas.
4. Reseeding: Reseed all areas and parts of areas, which fail to show a uniform stand of lawn until all areas are covered with strands of lawn.

#### **1.04 SODDED LAWN INSTALLATION**

##### **A. Sod Bed Preparation:**

1. Rolling: Roll amended soil with 200 pound water ballast roller.
2. Moistening: After all unevenness in the soil surface has been corrected, lightly moisten the soil immediately prior to laying the sod.
3. Timing: Sod immediately thereafter, provided the sod bed has remained in friable condition.

##### **B. Sodding Operations:**

1. Starter Strip: Lay the first row of sod in a straight line, with subsequent rows parallel to and tightly against each other, with no spaces between strips. Stagger lateral joints. Do not stretch or overlap sod. Butt all joints tightly to eliminate all voids.

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**Construction Specification**

Section 02930  
**LAWN AND SOD**

2. Cutting: Use a sharp knife to cut sod to fit curves and paving.
  3. Tamping and Rolling: Thoroughly tamp and roll sod to make contact with sod bed. Roll each entire section of completed sod.
  4. Watering: Thoroughly water sod immediately after installation to wet the underside of the new sod pad and the soil immediately below to a depth of 6 in.
  5. Top-Dress Fertilizer: Apply at the rate of six (6) pounds per 1,000 square feet at 25 days and at 50 days after sodding.
- 1.05    **CLEANING**
- A. Hydrosseed Overspray: Immediately after application, thoroughly wash off any plant materials, planting areas, or paved areas not intended to receive slurry mix.
  - B. Erosion: Immediately restore eroded areas. Keep all adjacent paved surfaces cleaned of dirt, mud or stains and organic debris.

**END OF SECTION**

**PART 1 - GENERAL****1.01 SCOPE**

- A. Work included: Labor, materials, tools, equipment, facilities, transportation and services necessary for and incidental to performing operations of work of this section, complete as shown on the drawings and specified herein. Work includes, but is not limited, to the following:
1. Finish grading of planting areas.
  2. Providing and preparing soil and soil mixes per agronomic soil test recommendations.
  3. Planting, including ground cover, trees, shrubs, seeded and sodded lawns.
  4. Staking and guying.
  5. Maintenance.
- B. Related work specified elsewhere includes but may not be limited to:
1. Section 02810 - Temporary Grassing and Erosion Control
  2. Section 02920 - Soil Preparation
  3. Section 02930 - Lawns and Sod
  4. Section 02940 - Landscape Planting
  5. Section 02950 - Trees, Shrubs, Vines and Groundcovers
  6. Section 02960 - Landscape Irrigation

**1.02 QUALITY ASSURANCE AND REQUIREMENTS**

- A. Standards:
1. Provide plants and planting material meeting or exceeding specifications of Federal, State and County and municipal laws requiring inspection for plant disease and insect control.
  2. Provide quality and size conforming with the current edition of "Horticultural Standards" for nursery stock as adopted by the American Association of Nurserymen.
  3. Provide plants, which are true to name. Tag one of each bundle or lot with the name and size of plants in accordance with standards of practice of the American Association of Nurserymen.
  4. In all cases, botanical names shall take precedence over common names.
- B. Workmanship: Perform work in accordance with the best standards of practice for landscape work and under the continual supervision of a competent foreman capable of interpreting the drawings and specifications.
- C. Quantities and types: Furnish plants in the quantities and/or spacing as shown or noted for each location, and of the species kinds and sizes described in the "List of Plant Materials", or as indicated on the drawings.
- D. Verification of dimensions and quantities: Scaled dimensions are approximate. Before proceeding with any work, carefully check and verify dimensions and quantities and immediately inform The Home Depot Project Manager of any discrepancy between the drawings and/or specifications and actual conditions. No work shall be done in any area where there is any such discrepancy until approval has been given by The Home Depot Project Manager.
- E. Submit documentation to The Home Depot Project Manager within twenty-five days after award of contract that plant materials available. Any and all substitutions due to unavailability must be requested in writing prior to confirmation of ordering.
- F. Plants shall be subject to review and approval by the Landscape Architect or Civil Engineer at place of growth or upon delivery for conformity to specifications. Such approval shall not impair the right of review and rejections during progress of the work. Submit written request for review of plant material at place of growth to the Landscape Architect or Civil Engineer. Written request shall state the place of growth and quantity of plants to be reviewed. The Landscape Architect or Civil Engineer reserves the right to refuse review at this time if, in his judgment, sufficient quantity of plants is not available for review. Review shall be for character and form.
- G. The Contractor shall submit specifications of any item being used on site upon the request of the Landscape Architect, Civil Engineer, and The Home Depot Project Manager.
- 1.03 SOIL FERTILITY AND AGRICULTURAL SUITABILITY ANALYSIS**
- A. After completion of rough grading and prior to soil preparation, the contractor shall obtain agronomic soils tests for planting areas. A minimum of one sample per two acres of planting areas shall be required. Tests shall be performed by a qualified soil testing laboratory and shall include a fertility and suitability analysis with written recommendations for soil amendment, fertilizer, and chemical conditioner, application rates for soil preparation, auger hole requirements, and post-maintenance fertilization program.
- B. The soils report recommendations shall take precedence over the minimum amendment and fertilizer application rates specified on the plans only when they exceed the specified minimums. Additional materials required by the soils report shall be paid for by Change Order.

**1.04 SUBMITTALS TO CONTRACTOR**

- A. Submit the name, address, and phone number of the consulting soil testing laboratory for approval to the Landscape Architect or Civil Engineer prior to obtaining services.
- B. Certification: Provide a certificate with each delivery of bulk material, stating the source, quantity, and type of material, and stating that the material conforms with the specified requirements:
1. For bulk delivered organic fertilizer, show on the certificate the volume, net weight, and percentages of nitrogen, phosphorus and potassium.
  2. For other fertilizers and amendments in containers, show on the certificate the total quantities by weight and volume for each material. The Landscape Architect or Civil Engineer reserves the right to take and analyze samples of materials for conformity to specifications. Furnish samples upon request of the Landscape Architect or Civil Engineer.

**1.05 DELIVERY, STORAGE AND HANDLING**

3. Product Data:
- a. Submit certification tags from trees, shrubs, sod, and seed verifying type of purity to Owner's CEC.
  - b. Submit photographs of each species of tree specified. Photographs shall be taken at grower's nursery prior to digging. Photographs shall contain tree with measuring rod in vertical position, showing overall height and spread with visual measurements, container size, root flare and root condition inside the container, and trunk caliper. Submit 30 days prior to plant material selection meeting.
- A. Delivery:
1. Deliver plants with legible identification labels.
  2. Protect plants and/or sod from drying out and from contamination.
  3. Deliver fertilizer to site in original unopened containers bearing manufacturer's guaranteed chemical analysis, name, trademark, and conformance to state law.
- B. Storage:
1. Maintain and protect plants yet to be planted in a healthy vigorous condition.
  2. Heel-in bare root and balled plant material with damp soil to protect from sun and wind.
- C. Handling:
1. Do not drop plant materials.
  2. Do not pick up container plant material by stems or trunks.

**1.06 WARRANTY AND REPLACEMENT**

- A. General:
1. Warrant shrubs and ground cover to grow and be healthy for a period of three months after Grand Opening.
  2. Warrant trees to live and grow in an acceptable uprights position for a period of one year after Grand Opening.
- B. Replacements: Any materials found to be dead, missing, or in poor condition during the maintenance period shall be replaced. The Home Depot Project Manager shall be the sole judge as to the condition of material. Material to be replaced within the guarantee period shall be replaced by the contractor within 15 days after written notification by the Home Depot Project Manager. The Home Depot Project Manager may at his discretion extend the maintenance period if he determines the above as a detrimental effect on the project.

**PART 2 - PRODUCTS****2.01 TOPSOIL**

- A. Existing soil on the site may be used as topsoil for planting purposes insofar as possible, but shall be free of debris, oil, weeds or other foreign matter. Contaminated soil shall be removed and replaced with acceptable existing soil or imported soil.
- B. Imported topsoil, if indicated on plans, shall be sandy textured. Silt plus clay content of this soil shall not be greater than 12% by weight. The boron content of this soil shall not be greater than 1 part per million as measured on the saturation extract. The sodium absorption ratio (SAR) shall not exceed 3.0 millimeters per centimeter at 25oC. Results of testing shall be delivered to the Home Depot Project Manager for approval.
- C. Light Weight Soil: Soil Mix #76 in all on-structure planters.
- D. Topsoil for use in preparing soil mixture for backfilling plant pits shall be fertilizes, friable, and of a loamy character, reasonably free of subsoil, clod lumps, brush weeds and other litter, free of roots, stumps, stones larger than 2" in any direction, and other extraneous or toxic matter harmful to plant growth. It shall contain three (3) to five (5) percent decomposed organic matter and have a pH between 5.5 and 7.0.

## 2.02 FERTILIZERS AND SOIL CONDITIONERS

- A. Organic Amendment: Nitrolized-mineralized redwood shaving (.5% actual nitrogen) or Nitrolized-mineralized fir shaving, (.8% actual nitrogen) or Nitrolized-mineralized fir bark (1% actual nitrogen). It shall be fine textured, having actual minimum 80% passing #8 screen and minimum 95% passing #4 screen. Salinity shall not be higher than 3.5 millimeters per centimeter at 25oC as measured by saturation extract conductivity.
- B. Commercial Fertilizer: An approved standard brand conforming with pertinent State fertilizer laws, uniform in composition, dry and free flowing. Provide the percentages by weight as noted in 3.04 of these specifications.
  - 1. Agricultural gypsum: Containing 98% minimum calcium sulphate, expressed as elemental.
  - 2. Soil Sulfur: Agricultural grade containing a minimum of 99% sulfur.
  - 3. Iron Sulfate: 20% iron derived from ferric and ferrous sulfate, 10% sulfur, expressed as elemental.
  - 4. Calcium Carbonate: 95% lime as derived from oyster shells.
- C. Planting Tablets: 12-month release, 20-10-5 Booster Packs as manufactured by RTI, (800)784-4769. Apply per manufacturer's instructions.

## 2.03 PLANT MATERIALS

- A. Plants shall be vigorous, of normal growth, free from disease, insects, insect eggs and larvae. Plants shall equal or exceed the measurements specified in plant list. The Landscape Architect or Civil Engineer shall judge for acceptability.
- B. No container plants that have cracked or broken root balls when taken from containers will be accepted.
- C. Plants shall have been grown under climatic conditions comparable to those of the project site, unless otherwise specifically approved by the Landscape Architect or Civil Engineer.
- D. Nomenclature conforms to customary nursery usage; for clarification, the term "multi-trunk" defines a plant having three or more trunks of nearly equal diameter.
- E. Seeds are to be fresh, clean, new crop seed composed of the varieties, mixed in proportions and testing minimum percentage of purity and germination as indicated herein.
- F. Sod is to be machine cut at a uniform thickness of 3/4" within a tolerance of 1/4", excluding top and growth and thatch. Each individual sod piece shall be strong enough to support its own weight when lifted by the ends. Broken pads, irregularly shaped pieces, and torn or uneven ends will be rejected.
- G. Substitute plant material will not be permitted unless specifically approved in writing by The Home Depot Project Manager.
- H. Plant species and size shall conform to those indicated on the drawings. All nursery stock shall be in accordance with grades and standards for nursery plants, latest edition, published by the Florida department of agriculture and consumer services. All plants shall be Florida grade no. 1 or better as determined by the Florida division of plant industry. All plants shall be healthy, vigorous, sound, well-branched, and free of disease and insects, insect eggs and larvae and shall have adequate root systems. Trees for planting in rows shall be uniform in size and shape. All materials shall be subject to approval by the owner. Where any requirements are omitted from the plant list, the plants furnished shall be normal for the variety. Plants shall be pruned prior to delivery only with approval from owner or owner's representative. No substitutions shall be made without written permission from the owner's representative.
- I. Inspection: plants shall be subject to inspection and approval at the place of growth, or upon delivery to the site, as determined by the owner, for quality, size, and variety. Such approval shall not impair the right of inspection and rejection at the site during progress of the work or after completion for size and condition of root balls or roots, latent defects or injuries. Rejected plants shall be removed immediately from the site. Notice requesting inspection shall be submitted in writing by the contractor at least one (1) week prior to anticipated date.

## 2.04 INERT GROUNDCOVER MATERIALS

- A. "Walk-On-Bark", as supplied by Sequoia Forest Products.
  - 1. Shall be a shredded wood and bark residual from pine and/or fir
  - 2. Grading: 

Sieve Size	Percent Passing
1"	95%
3/8"	50%
6 mesh	25%
  - 3. Shall be acid in relation with PH percent based on dry weight.
  - 4. Ash content not exceed 7 percent based on dry weight.

5. Moisture shall vary from 12 percent to 35 percent based on fresh material.
6. Shall be free of soluble salts such that the saturation extract conductivity shall not exceed 1.5.

**2.05 GUYING AND STAKING MATERIALS**

- A. Wood Tree Stakes: Pressure-treated pine, 2" x 2" diameter, and ±18" long.
- B. Steel Pipe Tree Stakes: Schedule 40 steel pipe, 1" diameter x approximately 18" long with cap, vinyl coated and pre-drilled with three holes near end as manufactured by Calsak Corporation, 15001 S. Main, Gardena, CA 90248, or approved equal.
- C. Ties: Cinch-Ties
- D. Steel Guy Anchor: 3/4" diameter x 36" steel vane as manufactured by Maxwell Steel Company, (213)944-6619, or approved equal.
- E. Guying Hardware:
  1. Wire: Pliable 3/32" galvanized braided cable.
  2. Wire Guard: 1/2" diameter white PVC tubing, full length of wire.
  3. Turnbuckles: Galvanized, or dip-painted, 1/2" x 6" long.
  4. Cable Clamps: Galvanized, size as required.
- F. Terra Toggle Earth Anchor System

**2.06 WOOD HEADER**

- A. Shall be installed according to the respective details and in strict adherence to construction plan. Wood shall be 2" x 4", 1" x 4", or laminated 1/2" x 4" rough, construction heart redwood; free from knots and splits. Wood stakes shall be 2" x 4" x 18' long construction, heart, redwood secured to header with 16 common galvanized nails. Header shall be secured at 5 feet maximum intervals. All stakes shall be placed on groundcover side of header board.

**2.07 WATER**

- A. See Section 01500 - Temporary Construction Facilities.

**2.08 DRAINAGE MATERIAL (CRUSHED ROCK)**

- A. 3/8" crushed rock - 95 - 100% passing through a 3/8" screen; 0 - 5% passing through No. 8 mesh; 80 - 100% per cubic yard.

**2.09 OTHER MATERIALS**

- A. Materials not specifically described but required for a complete and proper installation shall be as selected by the Contractor subject to the approval of The Home Depot Project Manager.

**PART 3 - EXECUTION****3.01 SUBSURFACE CONDITIONS AND PROTECTION OF PROPERTY**

- A. Prior to excavation for planting or placing of stakes, locate electrical cables, conduits and utility lines so that proper precautions may be taken not to damage such improvements. In the event of a conflict between such lines and plant location, promptly notify The Home Depot Project Manager, who shall arrange for relocation of one or other. Failure to follow this procedure places upon the Contractor the responsibility to repair damages at his own expense, which result from such work.

- B. Prior to planting, remove weeds, rocks, and debris.

- C. If the contractor is unable to dig plant pits to a depth that will provide 24" of soil beneath rootball, contact The Home Depot Project Manager immediately.

**3.02 SOIL PREPARATION**

- A. Soil Tilling: Cross rip planting areas to a depth of 9 to 12 inches.
- B. Uniformly broadcast and thoroughly incorporate the soil preparation mix as indicated below or on the plans to a depth of 6" by mechanical tiller or similar means.
- C. Soil Prep Mix: Per 1,000 sq. ft. Review the specification on the plan and the soils test to get the project specific mix. The contractor shall provide the specific mix for the project with no added charges. Listed below is a typical mix, but not project specific.
  1. Nitrogen stabilized organic amendment - 4 cu. yd.
  2. Planting fertilizer: 150 lbs. 5-3-1 Gro-Power.

3. Agricultural Gypsum - 25 lbs./cu. yd.
4. Soil Sulphur: 25 lbs.

D. Pre-Plant Weed Control:

1. If live perennial weeds exist on site at the beginning of work, spray with a non-selective systemic contact herbicide, as recommended and applied by an approved licensed landscape pest control advisor and applicator. Leave sprayed plants intact for at least fifteen days to allow systemic kill or as directed by advisor.
2. Maintain site weed free until final acceptance by Owner utilizing mechanical, manual and/or chemical treatment.

3.03 GRADING

A. Where any portion of the irrigation system is installed after grading and the fertilizing has been performed, refill and re-fertilize the upper portion of the backfill in accordance with the provisions of this section.

B. Fine grading: Upon completion of rough and finish grading, perform required fine grading of planting areas.

1. Do not work the soil when moisture content is so great that excessive compaction will occur, nor when soil is so dry that clods will not break readily.
2. Apply water, if necessary, to provide ideal content for tilling and for planting.
3. Grade so as to anticipate the finished grade:
  - a. Remove or redistribute excess soil before the application of fertilizer and mulch.
  - b. Where soil is to be replaced by plants and mulch, make allowance to prevent deficiency in the depth of mulch when final grading is completed.
4. Before and during preliminary fine grading, dig out and remove weeds and grasses. Dispose of off-site.

C. Grades and elevations: When fine grading is completed including weeding and fertilizing, and the soil has dried sufficiently to be readily worked, grade the lawn and planting areas to the elevations shown on the drawing:

1. Where grades are not otherwise indicated, provide uniform levels or slopes between points where elevations are given.
2. Make minor adjustments of grade where so directed by the Civil Engineer.
3. Provide finished grades which are even, uniform and without abrupt change of surface.
4. Slope soil away from structures to allow natural runoff of water, remodeling surfaces as required to do so. Grade low spots and pockets when soil is at optimum moisture content for working, provide for positive drainage.
5. Provide final finished grades in planting areas 1'-1/2" below paving and curbs or as shown on the drawing.
6. Remove soil generated by excavations to an approved off-site location, unless utilized to obtain desired grade.

3.04 PLANT PIT AND BACKFILL SOIL

A. Excavate plant pits for container plants with vertical sides and roughened surfaces, and shall be the size noted on drawings.

B. Backfill soil mix per cubic yard of soil:

1. 6 parts on-site soil.
2. 4 parts nitrogen stabilized organic amendment.
3. 15 lbs. "Gro-Power".
4. 2 lbs. iron sulfate; 10 lbs. agricultural Gypsum.

C. Thoroughly mix materials to the bottom of the pit so that they are evenly distributed and without clods or lumps. Compact to 90%.

D. Position the plant in the hole and backfill no higher than halfway up the root ball. Place the recommended number of plant tablets evenly around the perimeter of, and immediately adjacent to the root ball at a depth, which is between the middle and the bottom of the root ball. Complete the backfilling, tamp and water.

3.05 PLANTING TREES, SHRUBS, GROUNDCOVER, AND VINES

A. General:

1. Prior to planting, provide one percolation test per 6000 sq. ft. Fill a 24" box size hole with water. If it does not completely drain within 24 hours, notify The Home Depot Project Manager. The test shall be done with the supervision of the site superintendent.
2. Plant nursery stock immediately upon delivery to the site and approval by the Landscape Architect or Civil Engineer.
3. Do not plant until irrigation system installation is complete and until final grades are established and approved.
4. Plant locations shown on the drawings are tentative and subject to minor modification in the field as directed by The Home Depot Project Manager. Make such modifications at no additional cost to Owner.
5. Set plants so that when settled they will bear the same relation to the natural grade in the container.

B. Planting Trees:

1. Dig tree holes with vertical walls and level bottoms, making the hole twice the diameter of the root ball.



2. Backfill the hole with the specified mix, compacting as required, to the bottom of the boxed soil; insert the tree to the required grade; and backfill around sides with the specified mix.
  - C. Planting Shrubs and Groundcover:
    1. Plant shrubs in pits at least twice the diameter of the root ball and at least twice the depth of the root ball.
    2. Loosen the compacted soil at bottom pits, and fill with the specified mix, to the bottom of the ball and compact.
    3. Set the plant and backfill to the required grade with the specified mix, thoroughly tamping and watering.
    4. Prepare depressed water basin as wide as plant root balls at each plant. Water thoroughly, backfilling voids with the prepared mix.
    5. Plant groundcover in pits at least 4" x 4" x 4". Moisten the areas prior to planting, and do not plant in dry soil. Set plants in center of pits so that crown of plant will be level with finished grade after settling of soil, then backfill and water. Groundcover shall be planted in straight rows and evenly spaced. Plant at intervals noted on drawings. Triangular spacing shall be used unless noted otherwise on drawings.
    6. Mulch Cover: All groundcover, perennial and annual beds shall be top dressed with 3" layer of mulch.
  - D. Watering basin: Construct a mound of soil around each tree and plant to form a watering basin, placed at the edge and following the shape of the root ball:
    1. Make basin berms for trees, shrubs and vines from 5 gal., and larger containers at least 4" high. Unless otherwise directed, make other mounds at least 2" high.
    2. On slopes, construct half-mounds on the lower side if full mounds are not practical.
    3. After watering, refill settlement within the basins to the required grade, using the specified mix and recovering the surface with the specified mulch.
    4. Watering basins in shrub areas shall be planted with groundcover in normal pattern.
    5. If soil settling occurs, bring plants back up to grade of adjacent planting areas.
- 3.06 PLANTING LAWNS**
- A. General:
    1. Prepare the areas as previously specified, then rake and roll to a smooth, firm surface with uniform grade.
    2. Secure The Home Depot Project Manager's approval of prepared areas prior to planting. Plant sod as indicated on drawings.
  - B. Placing Sod:
    1. Place sod a maximum of 36 hours after initial harvesting. Thoroughly moisten areas to be sodded immediately prior to placing sod.
    2. Start watering immediately after completing each day's sodding. Apply water at a rate sufficient to ensure thorough wetting of soil to a minimum depth of 4 inches.
- 3.07 WATERING**
- A. Immediately after planting, apply water to each tree, vine and shrub by means of a hose in the planting basins until the material above the roots is completely saturated from the bottom to the top.
  - B. Provide thorough watering of ground cover by means of the irrigation system within one hour after ground cover planting.
  - C. Apply water in such quantities, and at such intervals, as required to keep the ground moist at all times will below the root system of grass and other planting.
  - D. Provide hose watering for plants, which cannot be efficiently watered with the irrigation system.
- 3.08 STAKING TREES SMALLER THAN 1-1/2" CALIPER**
- A. Remove nursery stakes and stake immediately after planting.
  - B. Where trees are not to be guyed at time of planting, stake such trees by placing stake in the prepared hole and driving minimum 2" x 2" pressure-treated wood stake 24" into solid ground.
  - C. Place the stake as close to the tree as possible without crowding or injuring the roots.
  - D. The trunk shall be secured to stakes with ties just below the head of the tree. Wire ties shall be secured by twisting the ends.
- 3.09 GUYING TREES LARGER THAN 1-1/2" CALIPER**
- A. Remove nursery stakes or bracing and guy immediately after planting.
  - B. Set three wire guys, equally spaced, around the tree and attach to the tree trunk or main branching using 3/32" braided cable and 1/2" X 36" long PVC tubing.

- C. Anchor guys to 2" X 2" X 24" pressure-treated stakes driven a minimum of 18" into solid ground.

**3.10 PRUNING**

- A. At no time shall trees or plant materials be pruned, trimmed or topped prior to delivery, and any alteration of their shape shall be conducted only with approval and when in the presence of the Civil Engineer.

**3.11 CLEANUP**

- A. After planting operations have been completed, remove trash, excess soil, empty plant containers and rubbish from the property. Scars, ruts, or other marks in the ground caused by this work shall be repaired and the ground left in a neat and orderly condition throughout the site.

- B. Leave the site broom-clean and wash down paved areas within the contract area, leaving the premises in a clean condition. Walks shall be left in a clean and safe condition

**3.12 OBSERVATION SCHEDULE**

- A. Notify the Civil Engineer seven days in advance for the following site visits:

1. Pre-job conference.
2. Final grade review.
3. Plant material review.
4. Plant layout review.
5. Soil preparation and planting operations. One tree with each type of specified staking shall be approved prior to planting of trees.
6. Pre-maintenance.
7. Final walk-through.

- B. When observations are conducted by someone other than the Civil Engineer, the contractor shall show evidence in writing of when and by whom these inspections were made.

- C. No site visits shall commence without items noted in previous observation reports either completed or remedied unless such compliance has been waived by the Owner. Failure to accomplish punch list tasks or prepare adequately for desired inspections shall make the contractor responsible for reimbursing the Civil Engineer at the current billing rates per hour plus transportation costs. No further inspections shall be scheduled until this charge has been paid and received.

**3.13 MAINTENANCE**

- A. Provide landscape maintenance from start of work until 90 days after Grand Opening. Maintenance includes watering of lawns, plants, trees, etc..., refertilization, weeding, mowing, cleaning up and edging, repairs of all washouts and gullies, repairs or protection, and other necessary work of maintenance. Maintain slopes against erosion.

**3.14 GUARANTEE**

- A. Guarantees after completion of maintenance period and final acceptance will be contingent on Owner's proper continuation of maintenance program.

- B. The Contractor, in protecting his own interests, is obligated to periodically check work areas during his guarantee period to insure proper maintenance procedures are being implemented.

- C. In case of negligent or improper maintenance, the contractor shall state in writing to the Owner his observations and recommendations. Any claims not in writing will not be considered.

- D. All cuttings, seed, and container plants up to and including 15 gallon size shall be guaranteed by the contractor as to growth and health for a period of ninety days after completion of maintenance period and final acceptance.

- E. Guarantee boxed and field-grown trees to "live and grow" in an "acceptable, upright position", for a period of one year after completion of the specified maintenance period and/or final acceptance. Definition of "live and grow" and "acceptable, upright position" shall mean that the tree must, during the guarantee period, sustain a healthy, vigorous appearance. It shall not defoliate more than 30% nor shall 30% of the foliage be dried and unhealthy appearance. If the tree, during the guarantee period does not sustain this specified appearance, it shall be removed and replaced by a contiguous planting, structure, lighting or sprinklers during replacement operations without cost to the Owner.

- F. Within fifteen days of written notification by Owner, remove and replace guaranteed plant materials, which for any reason fail to meet the requirements of the guarantee. Replacement shall be made with plant materials originally specified and shall meet original guarantees.

END OF SECTION

**Construction Specification****TREES, SHRUBS, VINES AND GROUNDCOVER****PART 1 - GENERAL****1.01 DESCRIPTION**

- A. General: Provide trees, shrubs, vines and groundcover in accordance with the contract documents.

**1.02 REFERENCES**

- A. "American Standard for Nursery Stock", 1990 Edition, American Association of Nurserymen, Inc.  
 B. Hortus III - 1976 Edition, Bailey Hortorium, Cornell University.  
 C. Florida Grades and Standards for Nursery Plants, 2015

**1.03 EXAMINATION OF SITE AND DOCUMENTS**

- A. By submitting a bid the Contractor affirms that he has carefully examined the site and all conditions affecting work under this Section. No claim for additional costs will be allowed because of lack of full knowledge of existing conditions.  
 B. Plans, specifications, surveys, measurements, other documents and dimensions under which the work is to be performed are believed to be correct, but the Contractor shall have examined them for himself during the Bidding period, as no additional compensation will be made for errors or inaccuracies that may be found therein.

**1.04 SUBMITTALS TO CONTRACTOR**

- A. Product Data: Manufacturer's current catalog cuts and specifications of the following:  
     1. Mulch and fertilizer tablets.  
     2. Anti-desiccant.  
 B. Drawings: Locations of fencing at drip lines of existing trees and plants to remain.  
 C. Certificates of Inspection: As required by law for transportation of each shipment of plants along with invoice.

**1.05 PLANT MATERIAL FIELD REVIEW PROCEDURE**

- A. Review: Submit a written request for review of plant materials and quantity at place of growth within (thirty (30) days after award of contract). Right is reserved to refuse review at this time if, in the judgment of the landscape architect, an insufficient quantity of plants is available for review.  
 B. Transportation: Contractor shall accompany Landscape Architect to all review(s) of plant materials at the nursery. Landscape Architect will review and tag plants at place of growth and review them upon delivery for conformity to specifications.  
 C. Distant Material: Submit photographs with a person adjacent to each plant type for preliminary review. Such review shall not impair the right of a growing grounds review and rejection during progress of the work.  
 D. Unavailable Material: If proof is submitted that a specified plant is not obtainable, a proposal will be considered for use of the nearest equivalent size or variety with corresponding adjustment of Contract price. Substantiate such proof in writing no later than 30 days after award of contract.  
 E. Special Conditions: The above provisions shall not relieve Contractor of the responsibility of obtaining specified materials in advance if special growing conditions or other arrangements must be made in order to supply specified materials.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Delivery: Do not deliver to the site disease-infected plant materials.  
 B. Labeling: Furnish standard products in manufacturer's standard containers bearing original labels legibly showing quantity, analysis, genus/species and name of manufacturer/grower.  
 C. Storage: Protect metal containers from sun during summer months with temperatures above 80 degrees F. Keep plants that cannot be planted immediately upon delivery in the shade, well-protected and well-watered. Heel in and protect with burlap all B & B plant materials, which cannot immediately be planted upon deliver.  
 D. Handling: Do not lift or handle container and B & B plants by tops, stems, or trunks at any time. Do not bind or handle plants with wire or rope at any time.  
 E. Anti-Desiccant: At Contractor's option, immediately before transporting, spray evergreen or deciduous plant materials in full leaf with anti-desiccant. Apply an adequate film over trunks, branches, twigs and foliage.  
 F. Digging: Dig B & B plants with firm, natural balls of earth of diameter not less than that recommended by American Association

**Construction Specification****TREES, SHRUBS, VINES AND GROUNDCOVER**

of Nurserymens Standard for Nursery Stock, and of sufficient depth to include the fibrous and feeding roots.

### 1.07 PROJECT/SITE CONDITIONS

#### A. Protection of Existing Plants to Remain:

1. Operations: Do not store materials of equipment, permit burning, or operate or park equipment under the branches of all existing plants to remain.
2. Barriers: Provide temporary fences at the drip line to protect existing plants to remain from damage during construction.
3. Notification: Give immediate written notification if other construction activities threaten to damage existing plants to remain.

#### B. Replacement of Damaged Plants:

1. Replace existing plants to remain which Contractor damages during construction with accepted plants of the same species; replacement size to be determined by Landscape Architect; cost of replacement shall be at no additional cost to Owner.
2. Landscape Architect will determine extent of damage and value of damage plants.

### 1.08 PLANTING SEASON

#### A. Contractor to use discretion based on current weather conditions.

- B. Deciduous Trees and Shrubs: In the fall after leaf drop occurs but before soil freezes, in the spring before growth begins.
- C. Evergreen Trees, Shrubs and Vines: Early Fall or late spring.

### 1.09 SEQUENCING AND SCHEDULING

#### A. Acceptance: Do not install plant materials prior to acceptance of finish grades and/installation of irrigation system.

#### B. Coordination: Coordinate with work of other sections to insure the following sequence of events:

1. General: Sprinkler system to be installed and operable prior to installation of plant materials.
2. in Paving: As necessary, install prior to pouring of paving under another section. See Drawings.
3. Pruning: Do not prune materials prior to installation and acceptance. Request review by Landscape Architect prior to pruning.

### 1.10 WARRANTY

#### A. The 90 day maintenance period begins the date of the Grand Opening of the store. The warranty period begins after the final acceptance of the maintenance period. The final acceptance occurs upon satisfactory completion of all work, included in the 90 day maintenance period, but exclusive of replacement of materials under the Warranty Period.

#### B. Correct Species: Warrant that all plant materials are true to species and variety.

#### C. Vigor: Warrant that all trees, shrubs, vines and groundcover planted under this Contract will be healthy and in flourishing condition of active growth one (1) year from date of Grand Opening.

#### D. Delays: Delays caused by the Contractor in completing planting into more than one planting season shall extend the Warranty Period correspondingly.

#### E. Conditions of Plants: Plants shall be free of dead or dying branches and branch tips, with foliage of normal density, size and color.

#### F. Replacements: As soon as weather conditions permit, replace, without cost to Owner all dead plants and all plants not in a vigorous, thriving condition, as determined by Landscape Architect during Maintenance and Warranty Periods.

#### G. Warranty Period. Report such conditions.

#### H. Dormancy Extension: Only the period of active growth shall be counted in measuring the duration of the Warranty Period. All plant materials installed just prior to or during their dormancy period shall have the Warranty Period extended accordingly. Time of onset of dormancy and resumption of active growth shall be as set by the Landscape Architect in accordance with regional and species-specific requirements.

### 1.11 REPLACEMENTS

#### A. Failed Materials:

1. Plant materials exhibiting conditions, which are determined as unacceptable due to workmanship by the Contractor, shall be repaired and/or replaced at no additional cost to the Owner.

**Construction Specification****TREES, SHRUBS, VINES AND GROUNDCOVER**

2. Replacements to be same species. Apply requirements of this Specification to replacements.
3. Contractor shall be held responsible for a maximum of two (2) replacements for each failed tree, shrub and vine, and same area of groundcover planting after final acceptance during warranty period.

## B. Incorrect Materials:

1. During Warranty Period: replace at no additional cost to Owner plants revealed as being untrue to name and species.
2. Provide replacements of a size and quality to match the planted materials at the time the mistake is discovered.

**PART 2 - PRODUCTS****2.01 MATERIALS**

- A. Plant Materials: Verify that all container stock has been grown in the containers in which delivered for at least one growing season, but not over two (2) years.
1. Growing Conditions: Plants shall be nursery-grown in accordance with good horticultural practices under climatic conditions similar to those of the project unless otherwise specifically authorized.
  2. Appearance: Trees shall be exceptionally heavy, symmetrical, tightly knit and so trained or favored in development and appearance as to be superior in form for their species, with regard to number of branches, compactness and symmetry.
  3. Vigor: Plants shall be sound, healthy and vigorous, well branched and densely foliated when in leaf. They shall be free of disease, insect pests, eggs, or larvae. They shall have healthy, well-developed root systems and shall be free from physical damage or adverse conditions, which would prevent thriving growth.
- B. Condition of Root system: Samples must prove to be completely free of circling, kinked or girdling trunk surface and center roots and show no evidence of a pot-bound condition.

## C. Measurements:

1. General: Measure plants when branches are in their normal upright position. Height and spread dimensions specified refer to main body of plant and not branch tip to tip. Take caliper measurement at a point on the trunk 6 in. above natural ground line for trees up to 4 in caliper (and at a point 12 in. above the natural ground line for trees over 4 in. in caliper).
2. Size Range: If a range of size is given, do not use plant materials less than the minimum size. Not less than 40 percent of the plants shall be as large as the minimum size acceptable and are the measurements after pruning, where pruning is required. Plants that meet the measurements specified, but do not possess a normal balance between height and spread shall be rejected.
3. Substitutions: Substituted plants shall be true to species and variety and shall conform to measurements specified except that plants larger may be used if accepted. Use of such plants shall not increase Contract price. If larger plants are accepted, increase the ball of earth in proportion to the size of the plant. Plants overgrown for their container size will be rejected.

- D. Unacceptable Trees: Trees, which have damaged or crooked leaders, will be rejected. Trees having a main leader shall not have been headed back. Trees with abrasions of the bark, sunscalds, disfiguring knots, or fresh cuts of limbs over 3/4 in. which have not completely callused, will be rejected.

- E. Pruning: Do not prune plants before delivery. Consult Landscape Architect for pruning after installation.

- F. Field Dug Stock: Prior to digging of field grown plant materials, insure that excess loose fill resulting from cultivation around stems and over roots be removed down to natural finish grade at crown of plant materials. During digging, verify that size of verrier shovel or other equipment is adequate to encompass the actively-growing root zone of all plants. Plants, which, after digging, show mostly large fleshy roots and few fibrous roots, will be rejected.

**2.02 FERTILIZERS**

## A. Slow-Release Fertilizer Tablets for Plant Pits:

1. Slow-release Fertilizer Tablet: "Agriform" 21 gram tablets with 20-10-5 (N-P-K) by Sierra Chemical Co. or accepted equivalent.

## B. Top-Dress Fertilizer for Groundcover Planting:

1. Top-dress Fertilizer: Osmocote as specified in soil preparation section.

**2.03 BACKFILL MIX**

## A. Backfill Mix:

1. Backfill mix shall be amended topsoil per recommendation of soil test report. See Section 02920 - Soil Preparation.

**2.04 ACCESSORIES**

- A. Tree Guying: As shown on drawings and as specified below.
1. Ground Anchors: 2" X 2" pressure-treated wood detailed.
  2. Guying Wire: 12 Gauge galvanized steel cable, size as specified.
  3. Turnbuckles: Galvanized or copper, size as required.
  4. Guy Covers: 3/8 in. diameter x 3 ft. long white plastic tubing. (Provide for all guyed installations as directed by Landscape Architect).
  5. Rubberhose: Two ply fiber bearing gardenhose. The hose color shall be black.
- B. Mulch:
1. Type: Shredded composted pine, fir or hardwood bark free of stubs, dirt, dust and other debris.
  2. Size: The mulch shall be shredded fibrous material with no chips or pieces of mulch of a chunk type present.
- C. Water:
1. Clean, fresh and potable, furnished and paid for by Contractor.
  2. Transport as required.
- D. Anti-Desiccant:
1. Type: Sprayable, water soluble vinyl-vinyldiene complex, which will produce a moisture retarding barrier not removable by rain or snow.
  2. Product: "Wilt-Pruf NCF" by Nursery Specialty Products, Inc. or accepted equivalent.

**PART 3 - EXECUTION****3.01 EXAMINATION**

- A. Verification of Conditions:
1. Soil Preparation: Do not commence planting work prior to completion and acceptance of soil preparation.
  2. Finish Grades: Finish grades for planting areas shall have been established in another section. Verify that all grades are within 1 in. plus or minus of required finish grade and that all soil amendments have been installed as specified under Section on Soil Preparation.
  3. Irrigation: Verify that irrigation system has been installed and accepted.

**3.02 PREPARATION**

- A. Layout and Staking: Lay out plants at locations shown on Drawings. Use 3 ft. lath, color-coded for each specie of plant material. Stake each tree, and major shrub. Outline shrub and groundcover beds with lime.
- B. Review: Locations of plants will be checked in the field and will be adjusted to exact position before planting begins. Right is reserved to refuse review at this time if, in the Landscape Architect's opinion, an insufficient quantity of plants is available.
- C. Equipment for Digging Plant Pits: Use backhoe to dig plant pits. Scarify all sides of the tree pit after excavation - see below. Do not use an augur or vernier spade.
- D. Plant Pits: Excavate square plant pits as follows:
- |                  | Width          | Depth         |
|------------------|----------------|---------------|
| Trees            | Rootball + 24" | Rootball + 6" |
| Shrubs           | Rootball + 12" | Rootball + 6" |
| Groundcover Beds | As Required    | 6"            |

**3.03 DRAINAGE TEST OF PLANT FOR TREE AND SHRUB PITS/OBSTRUCTIONS**

- A. Testing: Immediately after completion of excavation, test drainage of all tree pits and 4 representative shrub pits plant pits by filling with water twice in succession. Give written notification of conditions permitting the retention of water in plant pits for more than twenty-four (24) hours.
- B. Correction: Submit for acceptance a written proposal and cost estimate for the correction of poor drainage conditions before proceeding with planting.
- C. Obstructions: If rock, underground construction work, tree roots or other obstructions are encountered in the excavation of plant pits, acceptable alternate locations may be used at direction of Landscape Architect.
- D. For Trees and Shrub Plant Pit:
1. Location: At locations as determined by the Landscape Architect on site.
  2. Restrictions: Do not perform test on a rainy day or during freezing weather. Repeat all tests interrupted by rain or cold.

**Construction Specification****TREES, SHRUBS, VINES AND GROUNDCOVER**

3. Procedure:
  - a. Dig test pit of a size specified for the tree pits, a minimum of 4 ft. deep. Legibly calibrate a stake at 1 in. intervals and drive it firmly into the undisturbed soil at the bottom of the pit.
  - b. Fill test pit with water to within 1 ft. of the finish grade. Immediately record water level on the stake.
  - c. After 3 hours, record water level again. Repeat recording of water level once each hour for the succeeding five hours.
4. Documentation: Submit written documentation of all test pit results, dated and signed by the tester.
5. Rates:
  - a. Acceptable Rate: 2 in./hr. or more
  - b. Marginal Rate: 1 in. to 2 in./hr.
  - c. Unacceptable Rate: 1 in./hr. or less

**3.04 TREE, SHRUB AND VINE PLANTING**

- A. Handling and De-Potting of Plant Materials:
  1. Damage: Avoid damage to containers and wrappings and rootballs. If rootball is cracked or broken during handling and de-potting, plant will be rejected.
  2. Canned Trees and Shrubs: Metal Containers: Cut can on two sides with accepted cutting tool. Do not use spade. Plastic Containers: Tip container to horizontal orientation and shake carefully to remove shrub. Support rootball during installation to prevent cracking or shredding of soil.
  3. Boxed Trees: Lift from bottom with forklift or from sides with 2 in. x 4 in. rails nailed to each side of the box. Do not remove box prior to setting tree in plant pit. Remove sides of box after acceptance by Landscape Architect and prior to backfilling. Bottom of box may be left in place.
  4. Balled and Burlapped Plants: Lift and carry bottom of ball only. Do not remove wrapping until plant is set in plant pit. Cut all wire and peel wire and burlap away from upper 1/3 of rootball prior to backfilling.
    - a. Remove any plastic or fiberglass or other non decomposable wrapping material completely.
- B. Installation:
  1. Plant Pit Side Scarification:
    - a. Plant Rootball: After removing plant from container, scarify the sides of the rootball to a depth of 1 in. at four to six equally-spaced location around the perimeter of the ball or at 12 in. intervals on sides of boxed materials. cut and remove circling roots over 3/8 in. diameter.
    - b. Plant Pit: Scarify sides of all plant pits, thoroughly breaking up surfaces and eliminating "glazed" areas.
  2. Positioning: Backfill plant pit with backfill mix as shown on the drawings to allow setting crown of tree 2 in. above new finish grade and crown of shrub 1 in. above finish grade. Thoroughly foot tamp all backfill. Position plant in planting pit, maintaining plumb condition. Maintain plants in a thriving healthy condition throughout all planting operations.
  3. Backfilling:
    - a. Use backfill mix to backfill on-grade plant pits as shown on Drawings. Brace each plant plumb and rigidly in position until planting soil has been tamped solidly around the ball and roots.
    - b. When plants pits have been backfilled approximately 2/3 full, water thoroughly and saturate rootball, before installing remainder of the backfill mix to top of pit, eliminating all air pockets.
    - c. Slow-Release Fertilizer Tablets: Place evenly distributed in plant pits when backfilled 2/3 according to the following schedule:
      - i. Canned stock
        - a). 1 gallon can - 2 tablets 24" box - 8 tablets
        - b). 5 gallon can - 4 tablets 36" box - 10 tablets
        - c). 15 gallon can - 6 tablets 48" box - 12 tablets
      - ii. B & B stock
        - a). One tablet for 1 ft. of height
  4. Guying: When required guy as specified paragraph 3.05.
- C. Tree Wrap:
  1. Wrap trunks of deciduous trees of 1-1/2 in. caliper or more with a spiral wrapping to height of the third branch.
  2. Wrap from the bottom up and tie wrapping securely in place at the third tree branch.
  3. Remove tree wrap when tree guys are removed.
- D. Saucer: Form saucer with 3 in. high berm of backfill mix or soil mix as shown on the drawings centered around edge of each tree and shrub ball.
- E. Watering: Immediately water all plants after completion of planting operations.
- F. Settlement: Correct all settlement of materials immediately.

**3.05 GUYING**

- A. General: Guy all trees unless noted otherwise on the drawings.
- B. Guying:

1. Positioning: Guy trees at points of branching, with guys spaced equally around and outside perimeter of ball. Cover guys with rubber hose at points of contact with bark. Position guys at crotches and fasten to stakes.
2. Turnbuckle: Provide one (1) turnbuckle for each guy. Use two (2) cable clamps at each cable connection. (Place white plastic guy covers on all guys).
3. Mock-up: Install mock-up of manufactured products at job site per manufacturer's instructions for review and acceptance by Landscape Architect.

Tree Caliper		
<u>@ 12" Above Grade</u>	<u>Guys</u>	<u>Size</u>
1-1/2" (min.)	3 #12	1/4" x 4"
		<u>Turn-Buckle</u>
		two twists

3.06 MULCHING

- A. Install a 2 in. deep layer of mulch over all tree pits.
- B. Install a 2 in. deep layer of mulch over all shrub areas including tree and shrub watering basins.
- C. Install a 2 in. deep layer of mulch over groundcover areas prior to planting groundcover.

3.07 GROUNDCOVER ANNUAL OR PERENNIAL PLANTING

- A. Top-dress Fertilizer: Prior to mulching groundcover areas apply at the rate of 10 pounds per 1,000 square feet immediately before planting.
- B. Mulch groundcover areas immediately after fertilizing.
- C. Plant groundcover through the mulch.
- D. Water groundcover area immediately after planting.

3.08 MAINTENANCE

- A. Provide landscape maintenance from start of work until 90 days after Grand Opening. Maintenance includes watering of lawns, plants, trees, shrubs, etc.,; refertilization, weeding, mowing, cleaning up and edging, repairs of all washouts and gullies, repairs or protection, and other necessary work of maintenance. Maintain slopes against erosion.

END OF SECTION



**PART 1 - GENERAL****1.01 WORK INCLUDES**

- A. The work covered by this Section includes furnishing all labor, equipment, and materials required to design, furnish and install an underground sprinkler system as specified herein.
- B. The extent of the work is specified herein. Location of the irrigation sleeves and irrigation controller is shown on the Landscape Plan. Design, layout and documentation of the landscape irrigation shall be the responsibility of the Irrigation Contractor. The system shall be designed to provide full coverage to all landscaped areas and landscaped parking islands as indicated on the Landscape Plans.
- C. In his bid, the Irrigation Contractor shall provide a written list of all material and product quantities.
- D. The Irrigation Contractor shall completely familiarize himself with the site conditions and the requirements of the Contract prior to bidding the work in this Section.
- E. All work specified in this Section shall be performed by a qualified Irrigation Contractor with each of the following:
  - 1. Four (4) years of irrigation design
  - 2. Four (4) years of relevant installation experience
- F. All work and materials shall be in accordance with requirements of the authority having jurisdiction.
- G. The Irrigation Contractor shall alert the Landscape Contractor of all line and head locations. The Landscape Contractor shall use due caution so the Irrigation System is not damaged during landscape installation operations. The Landscape Contractor shall be responsible for any damage incurred during landscape operations.
- H. The entire irrigation system shall be fully operational prior to any planting.

**1.02 RELATED WORK UNDER SEPARATE CONTRACT**

- A. Electrical stub out for irrigation controller.
- B. Electrical stub for booster pumps or irrigation well pumps (if required).
- C. Water tap and stub for irrigation system.
- D. Installation of water meter (by utility company) and backflow prevention device(s) (by the Site Contractor).
- E. Landscaping installation and maintenance.

**1.03 RELATED WORK SPECIFIED ELSEWHERE**

- A. Related Sections:
  - 1. Section 01012 - Preferred Purchasing
  - 2. Section 02200 - Earthwork
  - 3. Section 02810 - Fine Grading and Erosion Control
  - 4. Section 02920 - Soil Preparation
  - 5. Section 02930 - Lawns and Sod
  - 6. Section 02940 - Landscape Planting
  - 7. Section 02950 - Trees, Shrubs, Vines and Groundcovers

**1.04 PREFERRED PURCHASING**

- A. Unless noted otherwise, Contractor and all subcontractors are encouraged to purchase all products listed in this specification section from a local The Home Depot Store. For more information, refer to Section 01012.

**1.05 QUALITY ASSURANCE**

- A. Requirements of Regulatory Agencies:
  - 1. All work and materials shall be in full accordance with the requirements of the authority having jurisdiction.
  - 2. Should the Contract Documents be at variance with the requirements of the authority having jurisdiction, notify Owner's Representative and the Civil Engineer for instructions before proceeding with work affected.
- B. Testing:
  - 1. Preliminary review of completed installation will be made prior to backfilling of trenches and during hydrostatic testing.

2. Final review shall be made in conjunction with the final review of lawn, shrub, and tree planting.
3. Electrical components, devices, and accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Permits and Inspections:

1. Any permits for the installation or construction of any work included under this contract, which are required by any of the legally constituted authorities having jurisdiction, shall be obtained and paid for by the Contractor, each at the proper time.
2. The Contractor shall also arrange for and pay all costs in connection with any inspection and examination required by these authorities.

1.06 SUBMITTALS TO CIVIL ENGINEER

- A. Certificate of Qualification: Prior to bid acceptance, submit certification of installer's experience identifying a minimum of four (4) previous projects with names of Owners and Landscape Architects and years of design and construction experience per requirements listed in section 1.01 to Owner's Representative for approval.

- B. Contractor shall furnish one (1) Manufacturer's service manual each to the Owner and the Owner's Construction Representative. Manuals may be loose-leaf and shall contain complete exploded drawings of all equipment installed showing components and catalog numbers together with the manufacturer's name and address.

- C. Record Drawings: The Contractor shall maintain one record set of prints of the sprinkler system in good condition at the site and mark on them the exact "Record". The Contractor shall make a daily record of all work installed during each day. Plans shall indicate the location of check valves, gate valves, wire locations, head layout, automatic valves, quick couplers. All irrigation and drainage piping etc., shall be shown on the prints. Locations should be shown by the triangular system of measurements from easily identified permanent features, such as buildings, curbs, fences, walks, etc. Drawings shall show approved substitutions, if any, of material including Manufacturer's name and catalog number. Upon completion all information noted on the prints shall be transferred to a reproducible mylar by the Contractor. Drawings shall be to scale and all information shall be recorded in a neat, orderly way.

1. At the time of the irrigation mainline test, the Contractor shall provide a preliminary set of "Record" drawings to the Owner's Construction Representative.
2. On or before the date of final inspection, the Contractor shall deliver one (1) reproducible mylar and two (2) sets of prints of the "Record" drawings to the Owner and the Owner's Construction Representative. The delivery of the prints shall not relieve the Contractor of the responsibility of furnishing required information that may have been omitted.

D. Substitutions:

1. The Contractor shall use materials as specified on the Civil Engineer and Owner approved Irrigation Plan. Material other than that specified will be permitted only after written application by Contractor and written approval by Owner's Representative prior to construction.
2. Substitutions will only be allowed when in the best interest of the Owner.
3. The installation of any approved substitution is the Contractor's responsibility. Any changes required for installation of any approved substitution must be made to the satisfaction of the Owner's Construction Representative and without additional cost to Owner.
4. If a substitution affects work by other trades, the irrigation contractor shall be responsible for all associated costs relative to such changes.

1.07 JOB CONDITIONS

- A. Examination of the Site: The bidder acknowledges that he has examined the site, Construction Documents, and specifications, and the submission of a quotation shall be considered evidence that examinations have been made.

B. Field Conditions:

1. The exact location of all existing utilities, structures, and underground utilities, which may not be indicated on the Construction Documents, shall be determined by the Contractor, and he shall conduct his work so as to prevent interruption of service or damage to them. The Contractor shall protect existing structures and utility services and be responsible for their replacement if damaged by him.
2. The Contractor shall verify the correctness of all finish grades within the work area to insure the proper soil coverage of the irrigation system pipes.

C. Coordination:

1. The Irrigation Contractor shall coordinate the schedule of his activities with the Owner's Construction Representative prior to commencing operations.
2. The Irrigation Contractor shall familiarize himself with other work and shall coordinate his activities with those of other Contractors in or adjacent to landscape work areas.
3. The Irrigation Contractor shall give notice to and obtain approval from the Owner's Construction Representative prior to proceeding with any site work covered under this contract.

**D. Discrepancies and Unsuitable Conditions:**

1. Prior to the start date of any operations, the Irrigation Contractor shall inspect the site to determine its suitability for the work under this Contract. The Irrigation Contractor shall verify the actual field conditions and inspect related work and adjacent surfaces. In addition, the Contractor shall verify that the work of other Contractors is sufficiently complete to permit the work under this Contract to be started properly. The Contractor shall report to the Owner's Construction Representative all conditions, which prevent proper execution of his work.
2. The Irrigation Contractor shall notify the Owner's Construction Representative of any discrepancies or unsatisfactory conditions and shall not commence operations until they have been corrected.

**1.08 MATERIALS STORAGE AND CLEAN-UP**

- A. The Contractor shall keep the premises free from rubbish and all debris at all times and shall arrange his material storage so as not to interfere with the operation of the project. All unused materials, rubbish, and debris shall be removed from the site.

**1.09 COMPLETION AND ACCEPTANCE**

- A. The completion of the contract will be accepted and Notice of Completion recorded only when the entire contract is completed to the satisfaction of the Owner's Construction Representative.
- B. Within ten (10) days of the Contractor's notification that the installation is complete, Owner's Construction Representative will inspect the installation and, if final acceptance is not given, will prepare a "punch list".
- C. Final Acceptance: Work under this section will be accepted by Owner's Construction Representative upon satisfactory completion of all work including "punch list" items.

**1.10 WARRANTY**

- A. The entire sprinkler system will be unconditionally guaranteed by the Contractor as to material and workmanship, including settling of backfilled areas below grade for a period of one (1) year following the date of Grand Opening of work and he hereby agrees to repair or replace any such defect occurring within that year at his expense.
- B. It shall be the Irrigation Contractor's responsibility to insure complete coverage as specified herein of the areas to be irrigated. During the warranty period the Irrigation Contractor shall make any adjustments as necessary to maintain proper coverage.
- C. If, within one year from the date of completion, settlement occurs, and adjustments in pipes, valves, and sprinkler heads, lawn areas or paving are necessary to bring the system, grade, or paving to the proper level of the permanent grades, the Contractor, as part of the work under this Contract, shall make all adjustments without extra cost to the Owner, including restoration of all damaged planting, paving, or other improvements of any kind.
- D. Should any operational difficulties in connection with the sprinkler system develop within the specified guarantee period, which, in the opinion of Owner may be due to inferior material and/or workmanship, said difficulties shall be immediately corrected by the Contractor to the satisfaction of the Owner at no additional cost to the Owner, including any and all other damages caused by such defects.

**1.11 OPERATION AND MAINTENANCE - IRRIGATION SYSTEM**

- A. Install sprinkler system after completion of site grading, storm sewer installation and utility installation. The irrigation system shall be installed and completely operational three days prior to installation of any planting operations.
- B. Operation of the irrigation system shall be confined to hours between 12 midnight and 7 a.m. Days and hours required by the authority having jurisdiction shall take precedence, as required.
- C. Important: It is the Landscape Contractor's responsibility to determine water application rates and timer cycling. The Irrigation Contractor will instruct the Landscape Contractor on the operation and programming of the controller and will assist the Landscape Contractor as necessary in such operations throughout the Warranty period. Any adjustments, repairs, etc., other than programming are the responsibility of the Irrigation Contractor.

**PART 2 - PRODUCTS****2.01 MATERIALS**

- A. All materials to be incorporated in this system shall be new and without flaws or defects and of quality and performance as specified and meeting the requirements of this system.
- B. All control valves, controller and related controller accessories shall be of like manufacturer to ensure full compatibility.

**2.02 WATER METERS**

- A. Water meter shall be provided and installed by the local water district in accordance with their requirements. Owner will pay cost.

**2.03 BACKFLOW PREVENTER**

- A. Shall be manufactured by:

1. Watts Regulator Company, Model 909, or approved equivalent (if installed within a building).
2. Watts Regulator Company, Model 719, or approved equivalent (if installed within a vault/pit/below grade)

**2.04 PIPE**

- A. All piping shall be from virgin parent material. The pipe shall be homogenous throughout and free from visible cracks, holes, foreign materials, blisters, deleterious wrinkles, and dents. All pipe shall be National Sanitation Foundation (NSF) approved.
- B. Piping on pressure side of irrigation control valves:

1. Shall be ASTM D1785 Polyvinyl Chloride (PVC) 1120 with a minimum class rating of 200, sized to maintain a flow velocity of less than five feet (5') per second (FPS). Mainline pipe shall be no less than 1-1/2" in diameter.
2. Type I, Grade I, Pressure Rated Pipe.
3. Materials shall meet the requirements set forth in ASTM D-1784-60T.
4. Outside diameter of pipe shall be the same size as steel pipe.
5. Pipe shall be marked at intervals (not to exceed 5') with the following information: Manufacturer's name or trade mark, nominal pipe size, schedule, PVC type and grade (i.e. PVC 1120), SDR rating class, working pressure at 73°F and (NSF) approval.
6. PVC Type I shall not be threaded.
7. Caution should be utilized in handling Type I pipe due to the possibility of cracking or splitting when dropped or handled carelessly.
8. When connection is plastic to metal, male adaptor shall be used. The male adaptor shall be hand tightened, plus one turn with a strap wrench.

- C. Piping on non-pressure side or irrigation control valves shall be: Polyvinyl Chloride (PVC): 1120 with a minimum class rating of 160, NSF approved, sized to maintain a flow velocity of less than five feet (5') per second (FPS).

- D. Pipe for sleeving: High impact pipe, polyvinyl chloride (PVC) 2110, minimum Schedule 40.

**2.05 SOLVENT**

- A. Solvent for PVC Pipe: Per ASTM D2564. Include primer according to ASTM F656.

**2.06 FITTINGS**

- A. Fittings for Solvent-Weld PVC Pipe: Schedule 40 or 80, polyvinyl chloride (PVC), Type I, to meet ASTM D2466-73 and D-2467-73 NSF approved. Manufactured by one of the following:

1. Lasco
2. Spears

- B. Threaded PVC nipples shall be Schedule 80 per ASTM D2464.

**2.07 SHUT OFF VALVES**

- A. Up to three inches (3") diameter: 125 pound bronze construction, non-rising stem type, sized to line. "Nibco" #T113 or approved equal.

**2.08 QUICK COUPLING VALVES (if applicable)**

- A. Valve and key shall be "Hunter", HQ-33DLRC and HK-33.
- B. Furnish two valve keys fitted with three-quarter inch (3/4") swivel hose ends; Hunter HS-0.
- C. All quick coupling valve keys and hose swivels shall be of the same manufacturer as the quick couplers.

**2.09 VALVE BOXES**

- A. To be injection-molded of polyesters and fibrous inorganic temperature resistant, components. Box and lid to be green, manufactured by one of the following:

1. Carson Industries, Inc.
  2. Ammorcast Products, Inc.
- B. For Remote Control Valve: Shall be rectangular or round in shape and sized to provide adequate clearance to operate and service valve.
- C. For Shut-Off Valves and Quick Coupler Valves: Shall be round, approximately nine inches (9") inside diameter by ten inches (10").
- 2.10 **MANUAL DRAIN VALVE**
- A. Manual drain valve to be provided by Irrigation Contractor and installed according to authority having jurisdiction's requirements and the manufacturer's most current printed instructions.
- 2.11 **SPRINKLER HEADS**
- A. All sprinkler heads shall be pop-up type heads. Acceptable manufacturers listed below:
1. Hunter Industries Inc. or approved equivalent.
- B. Spray nozzles for sprinkler bodies shall be of Hunter MP Rotators or approved equivalent.
- C. Spray Bodies shall be of Hunter MPR 40 or approved equivalent.
- D. Each sprinkler head shall include an internal 40 PSI regulator to ensure the MP Rotators are operating at the optimum pressure for highest efficiency.
- 2.12 **AUTOMATIC CONTROLLER**
- A. A fully automatic controller manufactured by Hunter Industries or approved compatible equivalent. Controller must have the following features:
1. Master on/off switch that permits system shutdown with programming maintained.
  2. ET capability
  3. Independent station programming.
  4. Independent station timing.
  5. Manual operation option.
  6. Variable day cycle.
  7. Battery powered models not permitted.
- B. Wall mounted installation, unless specified otherwise on the drawing.
- 2.13 **RAIN SHUT-OFF DEVICES**
- A. Shall be provided on each project. Acceptable models and manufacturer's listed below:
1. Hunter Industries Inc., Solar Sync (only compatible with Hunter PRO-C, ICC and ACC)
- 2.14 **ELECTRIC CONDUIT AND FITTINGS**
- A. Underground plastic conduit. Class III, FS W-C1094.
- 2.15 **CONTROL WIRE**
- A. Wire: Solid copper wire, U.L. approved for direct burial in ground. Minimum gauge: #14 UF. Common ground wire shall be white.
- 2.16 **SPlicing MATERIALS**
- A. Splicing materials: 3M Direct Bury (DBY) splice kits by 3M Corporation, Austin, Texas (512) 984-5657.
- 2.17 **REMOTE CONTROL VALVES**
- A. Remote controlled valves shall be commercial grade, electrically operated, normally closed, 24 Volt AC, 1 Ampere, constructed of corrosion resistant cycloc and stainless steel, capable of manual operation, and shall be self-flushing. The valve shall have a throttling device for system balancing and shall comply with all code and permitting requirements.

- B. Acceptable products:
1. Hunter Industries Inc.; ICV Valves
  2. Approved equivalent

**2.18 ROOT DRIP SYSTEM**

- A. Acceptable products:
1. Hunter Industries Inc.; RZWS Root Zone Watering System
  2. Approved equivalent
- B. Note: Only root ball drip systems shall be permitted. All-inclusive drip system shall not be permitted unless required by the Authority Having Jurisdiction and approved by the Owner's Construction Representative.

**PART 2 - EXECUTION****2.01 GENERAL**

- A. The Irrigation Contractor shall carefully schedule his work with the Landscape Contractor and all other site developments.
- B. Sleeves are required wherever piping or electrical wires are placed under paved surfaces. Install sleeves prior to commencement of paving. Irrigation Contractor shall coordinate sleeve placement with General Contractor.
- C. No consideration will be given to any design changes. Should any changes be deemed necessary after award of contract, for proper installation and operation of the system, the Owner's Construction Representative shall negotiate such changes.
- D. Lay out work as accurately as possible to design drawings. As-built drawings may be diagrammatic to the extent that swing joints (PVC), offsets and all fittings are not shown.
- E. Full and complete head to head coverage is required. Contractor shall make any necessary minor adjustments to layout as required to achieve full coverage of irrigated areas at no additional cost to the Owner. Triangular spacing shall be provided.
- F. Where the piping is shown on Construction Documents to be under paved areas to the running parallel and adjacent to planted areas, the intent is to install piping in planted areas.
- G. It shall be the Contractor's responsibility to establish the location of all sprinkler heads in order to assure proper coverage of all areas. All pipe damaged or rejected because of defects shall be removed from the site at the time of said rejection.

**2.02 TRENCHING**

- A. Perform all excavations as required for installation of work included under this Section, including shoring of earth banks, if necessary. Restore all surfaces, existing underground installation, etc., damaged or cut as a result of the excavations, to their original condition.
- B. Should utilities not shown on the Construction Documents be found during excavations, Contractor shall promptly notify Owner's Construction Representative and the Civil Engineer for instructions as to further action. Failure to do so will make Contractor liable for any and all damages thereto arising from his operations subsequent to discovery of such utilities. Indicate such utility crossings on the record drawings promptly.
- C. Trenches shall be open, vertical sided construction wide enough to provide free working space around work installed and to provide ample space for backfilling and compacting.
- D. When two (2) pipes are to be placed in the same trench, a six-inch (6") space is to be maintained between the pipes. The Contractor shall not install two pipes with one directly above the other.
- E. Trenches located under paving shall be backfilled with sand (a layer six inches (6") below the pipe and three inches (3") above the pipe) and compacted in layers of 95% compaction. Depth of trenches shall be sufficient to provide the minimum cover above the top of the pipe as follows:
1. 12" over non-pressure lateral lines
  2. 18" over non-pressure lateral lines under paving
  3. 18" over control wires
  4. 18" over sprinkler main line
  5. 24" over sprinkler main line under paving
- F. The Contractor shall cut trenches for pipe to required grade lines and compact trench bottom to prove accurate grade and uniform bearing for the full length of the line.

- G. All laterals and mainline shall be sufficiently sloped to provide a positive drainage through drain valves.
- H. The Contractor shall be held responsible for any damages caused by these operations and shall immediately repair or replace damaged parts.

**2.03 BACKFLOW PREVENTION DEVICE**

- A. Backflow prevention device to be provided by the Site Contractor if outside of the building; by the plumbing contractor if connected to the building irrigation or domestic system.
- B. Backflow prevention device shall be installed in accordance with the requirements of the authority having jurisdiction and manufacturer's latest printed instructions.

**2.04 PIPE LINE ASSEMBLY**

- A. General:
  - 1. Install pipes and fittings in accordance with manufacturer's latest printed instructions.
  - 2. Clean all pipes and fittings of dirt, scales and moisture before assembly.
  - 3. All pipe, fittings, and valves, etc. shall be carefully placed in trenches. Interior of pipes shall be free from dirt and debris and when pipe laying is not in progress, open ends of pipe shall be closed by approved means.
  - 4. All lateral connections to the mainline as well as other connections shall be made to the side of the mainline pipe. No connections to the top of the line shall be allowed.
- B. Solvent-Weld Joints to PVC Pipes:
  - 1. Use solvents and methods of pipe and solvent manufacturers.
  - 2. Use a primer prior to applying pipe joining solvents to prepare pipe joint.
  - 3. Cure joint a minimum of one hour before applying any external stress on the piping and at least twenty-four (24) hours before placing the joint under water pressure, unless otherwise specified by manufacturer.
- C. Threaded Joints for PVC Pipes:
  - 1. Use Teflon tape on all threaded PVC fittings.
  - 2. Use strap-type friction wrench only. Do not use metal-jawed wrench.
  - 3. When connection is plastic to metal, male adapters shall be used. The male adapter shall be hand tightened, plus one turn with a strap wrench.
  - 4. Damaged Threads: Do not use pipe or pipe fittings with threads that are damaged or cracked.
- D. Laying of Pipe:
  - 1. Pipes shall be bedded in at least two (2") of finely divided material with no rocks or clods over one inch (1") diameter to provide a uniform bearing.
  - 2. Pipe shall be snaked from side to side of trench bottom to allow for expansion and contraction. One additional foot per 200 feet of pipe is the minimum allowance for snaking.
  - 3. Do not lay PVC pipe when there is water in the trench.
  - 4. Plastic pipe shall be cut with PVC pipe cutters or hacksaw, or in a manner so as to ensure a square cut. Burrs at cut ends shall be removed prior to installation so that a smooth unobstructed flow will be obtained.
  - 5. All plastic-to-plastic joints will be solvent-weld joints or slip seal joints. All plastic pipe and fittings shall be installed as outlined and instructed by the pipe manufacturer, and it shall be the Contractor's responsibility to make arrangements with the pipe manufacturer for any field assistance that may be necessary. The Contractor shall assume full responsibility for the correct installation.
- E. PVC Sleeves and Electrical Conduit:
  - 1. All PVC sleeves shall be a minimum of twice (2x) the diameter of the pipe to be sleeved.
  - 2. All PVC control wire conduit shall be of sufficient size to hold the required quantity of control and common wires.
- F. Thrust Blocks:
  - 1. Concrete thrust blocks must be provided on the thrust side of the mainline pipe wherever the pipeline is larger than 2½" in diameter, and changes direction, as at tees or bends, or dead-ends.

**2.05 IRRIGATION CONTROL VALVES**

- A. Install control valves in valve boxes grouping together where practical. Place no closer than twelve inches (12") to walk edges, buildings, and walls.
- B. Pressure regulating remote control valves shall be adjusted so that most remote sprinkler heads operate at the pressure specified.

- C. Valves shall be installed as shown in details and in accordance with manufacturer's instructions and the specifications.

**2.06 QUICK COUPLING VALVES (Where applicable)**

- A. Shall be set a minimum of twelve inches (12") from walks, curbs, or paved areas where applicable or as otherwise noted. Quick coupling valves shall be housed in valve boxes.
- B. Valves shall be installed on a three inch (3") elbow PVC Schedule 80 swing joint assembly.

**2.07 VALVE BOXES**

- A. Valve boxes shall be set flush with finish grade in lawn areas and one half inch (½") above finish grade in ground cover and shrub bed areas.

**2.08 SPRINKLER HEADS**

- A. All sprinkler heads shall apply water at a minimum rate of 0.55 in/hr or less when installed on square spacing and head to head coverage.
- B. All sprinkler heads within a zone shall have matched precipitation rates.
- C. All heads operating on one valve (zone) shall do so at the same pressure.
- D. Do not mix different types of heads within a zone.
- E. Shrub beds and lawn areas are to be on separate valves (zones).
- F. Place pop-up sprinkler heads six inches (6") from edge of adjacent walks, curbs, and mowing bands, or paved areas at time of installation.
- G. All sprinkler nozzles shall be adjusted for the proper radius and direction of spray pattern. Make adjustments where possible to prevent overspraying onto walks, pavement, or buildings.
- H. Sprinkler heads and quick coupling valves shall be set perpendicular to finished grade unless otherwise designated on the plans.

**2.09 DRAIN VALVES**

- A. The mainline and laterals shall be drained with manual drain valves.
- B. Drain valves are to be provided at sufficient intervals to provide complete drainage of all piping.

**2.10 AUTOMATIC CONTROLLER**

- A. The location of the automatic controller shall be coordinated with the Owner by the General Contractor. Obtain approval of controller location from the Owner's Representative.
- B. All local and other applicable codes shall take precedence in connecting the 110-volt electrical service to the Controller.
- C. Install per local code, manufacturer's latest printed instructions, and as detailed.
- D. Connect remote control valves to controller in sequence to correspond with station setting beginning with Stations 1, 2, 3, etc.
- E. Affix controller name (i.e. "Controller A") on inside of controller cabinet door with letters minimum of one inch (1") high. Affix a non-fading copy of irrigation diagram to cabinet door below controller name. Irrigation diagram shall be a reduced copy of the as-built drawing and shall show clearly all valves operated by the Controller, showing station number, valve size, and type of planting irrigated.

**2.11 CONTROL WIRING**

- A. All electrical equipment and wiring shall comply with local and state codes and be installed by those skilled and licensed in the trade.
- B. Wiring shall occupy the same trench and shall be installed along the same route as pressure supply or lateral lines wherever possible, and shall have a minimum of eighteen-inch (18") cover.
- C. Control wire shall be installed to the side of the main line whenever, possible. Placement over pipes is not permitted.



- D. When more than one (1) wire is placed in a trench, the wiring shall be taped together at intervals of ten feet (10').
- E. An extension curl shall be provided within three feet (3') of each wire connection and at least every one hundred feet (100') of wire length on runs of more than one hundred feet (100') in length. Expansion curls shall be formed by wrapping at least five (5) turns of wire around a one inch (1") diameter pipe, then withdrawing pipe.
- F. Control wire splices at remote control valves to be crimped and sealed with specified splicing materials. Line splices will be allowed only on runs of more than 500 feet (500') and they must be located in ten inch (10") round splice boxes which are green in color. The connector shall be 3MD splice kit by 3M Corporation, or "Snip-Snap" connector by Imperial. Use one splice per connector sealing packs.
- G. The main line shall have two (2) spare wires installed its entire length and to the automatic controller. Label each end "spare wire".

**2.12 CLOSING OF PIPE AND FLUSHING OF LINES**

- A. All testing shall be done under the supervision of the Owner's Construction Representative. Submit written requests for inspections to the Owner's Construction Representative at least three (3) days prior to the anticipated inspection date.
  - 1. Thoroughly flush all water lines under a full head of water before installing heads, electronically controlled valves, quick coupler assemblies, etc. Maintain flushing for a minimum of three (3) minutes at the valve located farthest from water supply.
  - 2. After flushing, cap or plug all openings to prevent entrance of materials that would obstruct the pipe or clog heads. Leave in place until removal is necessary for completion of installation.
  - 3. Test as specified below.
  - 4. Upon completion of testing, complete assembly and adjust sprinkler heads for proper distribution.
  - 5. All sprinkler heads and quick coupling valves shall be set perpendicular to finished grades unless otherwise designated on the drawings, or otherwise specified. Sprinkler heads adjacent to existing walls, curbs, and other paved areas shall be set to grade. Sprinkler heads, which are to be installed in lawn areas where the turf has not yet been established, shall be set one inch (1") above the proposed finish grade. Heads installed in this manner will be lowered to grade when the turf is sufficiently established to allow walking on it without appreciable destruction. Such lowering of heads shall be done by this contractor as part of the original contract with no additional cost to the Owner.

**2.13 TESTING**

- A. Making hydrostatic test when welded PVC joints have cured as per manufacturer's instructions.
  - 1. Pressurized Mains:
    - a. Completely install water meter, mains, isolation valves and control valves. Do not install laterals.
    - b. Open all isolation valves.
    - c. Fill all lines with water and shut off at meter.
    - d. Pressurize the main with air to 70 psi. Monitor gauge for pressure loss for four (4) hours.
    - e. Leave lines and fittings exposed throughout testing period.
    - f. Leaks resulting from test shall be repaired and tests repeated until the system passes.
    - g. Test all isolation valves for leakage.

- B. Non-Pressure Laterals: Test piping after laterals and risers are installed and system is fully operational. Leave trenches open to detect possible leaks.

- C. Electrical Testing:

- 1. Wiring from the controller to each electronically controlled zone valve shall be tested for continuity and operation prior to backfilling and making final connections.
  - 2. The Irrigation Contractor shall ensure the system is free of short circuits or damage of the wiring at all times.
  - 3. Spare wiring should be checked for continuity and shall be verified that the spare wires are free of short circuits or damage at all times.

**2.14 INSPECTION**

- A. The Contractor shall maintain proper facilities and provide safe access for inspection to all parts of the work.
- B. Irrigation inspection shall consist of a minimum of:
  - 1. Mainline Pressure Test.
  - 2. Coverage Test.
  - 3. Final Irrigation Inspection.
- C. If the specifications, the Owner's Representative's instructions, laws, ordinances, or any public authority require work to be

specifically tested or approved, the Contractor shall give the Owner's Representative three (3) days notice of its readiness for inspection.

- D. The Contractor shall be solely responsible for notifying Owner's Construction Representative where and when such work is in readiness for testing.
- E. If any work should be covered up without approval of Owner's Construction Representative, it must be uncovered, if required, for examination at Contractor's expense.
- F. No inspection will commence without "Record" drawings and without completing previously noted corrections, or without preparing the system for inspection.

## **2.15 BACKFILL AND COMPACTING**

- A. After system is operating and required tests and inspections have been made, backfill excavations and trenches.
  - 1. Backfill for all trenches, regardless of the type of pipe covered, shall be compacted to minimum 95% density under pavements, 85% under planted areas.
  - 2. Backfill material shall be approved soil. Unsuitable materials, including clods and rocks over two inches (2") in size shall be removed from the site.
  - 3. A fine granular material shall be placed initially on all lines with a minimum of three inches (3") cover. No foreign matter larger than one-half inch ( $\frac{1}{2}$ ") in size shall be permitted in the initial backfill.
  - 4. See section 3.02, item E regarding backfill of trenching.
  - 5. Compact trenches in areas to be planted, by thoroughly flooding the backfill.
  - 6. Within all planting and lawn areas the existing six-inch (6") layer of topsoil shall be restored to its original condition and finish grade.
  - 7. The Contractor shall dispose of surplus earth remaining after backfilling off-site.

## **2.16 CONCLUSION**

- A. It has been our purpose in preparing these specifications to provide the Irrigation Contractor with all information necessary to design and install a sprinkler system which is complete in every detail, meets the criteria of the Owner and local authorities; and is consistent with good irrigation design and installation practice.
- B. Please call to our attention any discrepancies in the specifications as they relate to actual on-site conditions. Discrepancies of any sort shall not be taken advantage of and construction shall be pursued efficiently and rapidly in the letter and spirit of these specifications.

**END OF SECTION**

**Construction Specification****PERMANENT PLASTIC CONCRETE FORMING****PART 1 - GENERAL****1.01 SUMMARY**

- A. Extent of permanent pre-molded plastic concrete forming as shown on drawings and indicated by provisions of this section.
- B. Applications of installation specified in this section include the following:
  - 1. Foundation sleeves
  - 2. Light pole base covers
  - 3. Bollard sleeves (optional)
- C. Related Work specified elsewhere includes but not limited to:
  - 1. Section 03300: Cast-In-Place Concrete

**1.02 REFERENCES**

- A. Unless otherwise shown or specified, the work shall conform to the following standards and recommendations of the American Concrete Institute (ACI):
  - 1. ACI 117: Standard Tolerances for Concrete Construction and Materials.
  - 2. ACI 301: Specifications for Structural Concrete
  - 3. ACI 318: Building Code Requirements for Structural Concrete

**1.03 DELIVERY, STORAGE AND HANDLING**

- A. Permanent plastic forming shall be delivered to the job site with the manufacturer's original package labels.
- B. General Contractor to store material in a location to avoid damage to units.

**PART 2 - PRODUCTS****2.01 ACCEPTABLE MANUFACTURES**

- A. Ceme-Tube LLC; 579 Schommer Dr.; Hudson, WI 54016; Phone (715) 377-2133
- B. Substitutions: none

**2.02 MATERIAL**

- A. Preformed Units pre-molded with partially recycled HDPE plastic. Unit sizes to fit applications indicated, selected from manufacturer's standard widths and lengths.

**2.03 FOUNDATION SLEEVES**

- A. Standard Ceme-Tube. Color: Black

**2.04 LIGHT POLE BASE FORMS**

- A. Light Pole Ceme-Tube. Color: standard yellow

**2.05 BOLLARD FORMS (optional)**

- A. Bollard Ceme-Tube. Color: standard yellow

**2.06 ACCESSORIES**

- A. Standard black Ceme-Tube domed cap as required for construction.
- B. Bollard dome caps (when bollard forms are used)

**PART 3 - EXECUTION****3.01 INSTALLATION**

- A. Design, construct, erect, and support formwork and related items in accordance with most stringent requirements of ACI 117, 301, and 318.
- B. Standard black Ceme-Tube must be used below grade below Light Pole Ceme-Tube or Bollard Ceme-Tube to provide deeper

**Construction Specification****PERMANENT PLASTIC CONCRETE FORMING**

footings and stability.

- C. Comply with manufacturer's instructions for particular conditions of installation in each case. If printed instructions do not apply to project conditions, consult manufacturer's technical representative for specific recommendations before proceeding with work. Refer to manufacturer's website at [cemetube.com](http://cemetube.com) for installation instructions and more information.
- D. Contractor is responsible for coordination of light pole anchor bolt installation.
- E. Pour concrete per the requirements of section 03300.
- F. Pre-molded plastic formwork to remain in place after installation.

**3.02 CLEAN UP**

- A. Clean concrete or asphalt residue off exterior of Light Pole or Bollard Ceme-Tube with water.

**3.03 PROTECTION**

- A. General: Protect installed units from damage

END OF SECTION

**Construction Specification****(FBO) SLAB ON GROUND ACCESSORIES (PNA)****PART 1 - GENERAL****1.01 SUMMARY**

- A. This section includes slab on ground dowel system, slab joint protection bars, and single use curing sheets as manufactured by PNA Construction Technologies, Inc.
- B. Related Work specified elsewhere includes but not limited to:
  - 1. Section 01010 - Furnished By Owner Items (FBO)
  - 2. Section 03390 - Slab on Ground

**1.02 GENERAL**

- A. The Home Depot has a national account contract with PNA Construction Technologies, Inc. to supply their patented slab on ground dowel system (Diamond Dowel ® Systems - 1/4" and PD3 Basket ® Assemblies - 6 plate 3/8" x 12" at 24" on center for a 6" slab), their patented slab joint protection bars (Armor-Edge ® Joint Assemblies), and their single use curing sheets (HydraCure™ S16 curing covers) for moist curing slabs. Home Depot will purchase direct from PNA Construction Technologies and supply the material to the General Contractor.
- B. The General Contractor is responsible for receiving, offloading, inspecting, storing, handling, installing, project management functions for, plus installation warranty for, the PNA Construction Technologies products. The General Contractor will cooperate with PNA Construction Technologies to ensure material requirements are defined, ordered and installed in a timely matter.
- C. General Contractor is required to include all management required to perform warranty work during warranty period whether, the materials are furnished by Home Depot or furnished by the General Contractor. The General Contractor is required to include all labor required to perform warranty work during warranty period.
- D. This warranty work will include defining warranty components, ordering warranty components, installing or reinstalling warranty components, and all management and labor required to satisfy warranty issues.
- E. PNA Construction Technologies, Inc. shall manufacture all slab-on-ground dowels (Diamond Dowel ® Systems - 1/4" and PD3 Basket ® Assemblies - plate 3/8" x 12" at 24" on center for a 6" slab), all slab-joint protection bars (Armor-Edge ® Joint Assemblies), and single use curing sheets for moist curing the slabs on ground identified on the structural construction drawings (building and vestibule floors, garden center slab, building apron slab, drive-thru slab, rear lumber slab, truck dock slab, etc.). The products will be furnished by Home Depot and installed by the General Contractor. The General Contractor shall provide any additional non-factory related devices or accessories required to install the products.
- F. General Contractor shall include in his price all labor and equipment rental necessary to completely install the slab on ground dowels and slab edge reinforcing as indicated on the plans, and shall perform all warranty work required during the warranty period.

**1.03 FBO PROCEDURES**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section. General requirements related to Furnished by Owner (FBO) Items are as defined in Section 01010. All FBO Forms listed below are included as part of Section 01010.
- B. Vendor Contact: Contractor shall send a completed "FBO Form A: Contractor Information Form" to the FBO vendor indicated below, twelve (12) weeks prior to the scheduled installation of the specified system:

PNA Construction Technologies, Inc.  
 Nine Dunwoody Park  
 Suite 111  
 Atlanta, GA 30338  
 Attn: **Mary Campbell** - National Account Coordinator  
 Phone: 770-455-6800  
**(No fax or email. Use Expesite for documented communications)**

- C. Take-Offs: FBO Vendor shall provide "take-offs" to the Contractor as specified in Section 01010. The Contractor shall then verify this "take-off" using an "FBO Form B: Take-Off Confirmation Sheet".
  - 1. The FBO vendor's "take-off" shall constitute the pre-purchased quantity furnished by owner and will be based on the joint layout shown on the drawings.
  - 2. The contractor shall perform their own "take-off" based on the joint layout shown in the drawings or an alternate joint layout within the limits described in Section 03390. Quantities of product that the contractor requests in excess of

**Construction Specification****(FBO) SLAB ON GROUND ACCESSORIES (PNA)**

- the pre-purchased quantities shall be included as part of the Contractor's bid. The Home Depot will reject any change orders made for additional product in addition to the pre-purchased quantity.
- D. Receipt of Shipment: Contractor shall verify shipment per the requirements of Section 01010 and complete the "FBO Form C: Confirmation of Shipment" and submit back to the FBO vendor.
  - E. Request for Changes: Changes to materials and quantities after receipt of shipment shall be coordinated by the contractor with the FBO vendor per the requirements of Section 01010 using an "FBO Form D: Request For Additional/Replacement Materials". The contractor is responsible to purchase any additional materials from PNA Construction Technologies above and beyond those listed on the "FBO Form B: Take-Off Confirmation Sheet".
  - F. Return Merchandise Authorization Policy: The Home Depot will add to the contractors' scope of work the responsibility for coordinating (1) customer accommodation return request through the FBO Vendor. Requests shall be submitted using the "FBO Form E: Returned Materials" as specified in Section 01010.
    - 1. Restocking charges shall be assessed as follows:
      - a. PNA Construction Technologies designated stock items on Home Depot's standard schedule: Maximum 20%
      - b. Non-stock PNA Construction Technologies items not on Home Depot's standard schedule: Maximum 35%
      - c. Additional restocking charges may be applied based on the condition of the product received or the degree of modification of the non-stock items.
    - 2. A separate detailed credit memo shall be used for each return. Home Depot will make no deduction until the credit memo has been received.
    - 3. PNA Construction Technologies may limit returns to no more than 5% of the original order value of the material shipped.

**PART 2 - PRODUCTS****2.01 GENERAL**

- A. Acceptable manufacturer:
  - 1. PNA Construction Technologies
  - 2. No Substitutions.
- B. Smooth plate bars, ASTM A36 minimum.
  - 1. Do not shear. Remove burrs.

**2.02 PLATE DOWEL SYSTEM**

- A. Acceptable system:
  - 1. "Load Transfer System for Construction and Contraction Joints" by PNA Construction Technologies

**2.03 CONSTRUCTION JOINTS**

- A. Acceptable system at all construction joints:
  - 1. "Diamond Dowel® Systems" by PNA Construction Technologies
    - a. "Diamond Dowel® Systems" will be 1/4" x 4 1/2" x 4 1/2", spaced at 24" on center, located at mid-depth of the slab.

**2.04 SAW CUT CONTRACTION JOINTS IN FIBER REINFORCED SLABS**

- A. Acceptable system:
  - 1. "PD3 Basket ® Assemblies" by PNA Construction Technologies
    - a. "PD3 Basket ® Assemblies" will be furnished in fully welded assemblies with six (6) 3/8" x 2" x 12" PD3 plates spaced at 24" on center. The assembly will support the plates at the mid-depth of a 6" slab.

**2.05 ABUTTING SLAB EDGES WITHIN SPECIFIED DOOR OPENINGS**

- A. Acceptable system where specifically identified on the drawings:
  - 1. "ARMOR-EDGE® Joint Assembly" by PNA Construction Technologies
    - a. "ARMOR-EDGE® Joint Assembly" reinforcing will be two 3/8" x 2" bars with 3/8" diameter x 4" long headed-studs spaced 12" on center. The bars shall extend the width of the door opening and be discontinuous at transverse construction or contraction joints.

**Construction Specification****(FBO) SLAB ON GROUND ACCESSORIES (PNA)****2.06 SHEET MATERIALS FOR MOIST CURING CONCRETE SLABS: ASTM C 171**

- A. Synthetic Fiber/Plastic Sheet, Single Use
  - 1. White synthetic fiber matting securely attached to white plastic sheet backing.
  - 2. Ensure sheets are new and have never been used before.
  - 3. Acceptable System:
    - a. "HydraCure™ S16 curing covers" by PNA Construction Technologies

**PART 3 - EXECUTION****3.01 INSTALLATION**

- A. Slab Reinforcing:
  - 1. Place all PNA joint reinforcement products in accordance with the manufacturer's installation details.
- B. Slab on Ground Dowels:
  - 1. For plate dowel system, conform to manufacturer's recommendations.

**3.02 CURING CONCRETE SLABS**

- A. See section 03390 for full description of curing process.
- B. Place HydraCure™ S16 curing covers in accordance with manufacturer's recommendations and smooth sheet to remove all wrinkles.

END OF SECTION

**Construction Specification****CAST-IN-PLACE CONCRETE****PART 1 - GENERAL****1.01 SCOPE OF WORK**

- A. Include all labor, materials and appliances, and perform all operations in connection with the installation of Concrete Work, and all related work incidental to the completion thereof, as shown on the drawings, complete, in strict accordance with the drawings and as specified herein. Concrete work includes:
  - 1. Concrete, reinforcing and formwork for pile caps, grade beams, footings, foundations, pilasters, slabs (except where specified otherwise), stairs, foundations for light poles and signs, foundation pads for equipment, etc.
  - 2. Installation of anchor bolts for steel columns, posts, and other anchored work as may be required.
  - 3. Grouting of column bases.
  - 4. All anchor slots, sleeves, and other inserts as required.
  - 5. Shop drawings.
  - 6. All other items required to make the work of this Section complete including staking for layout of footings, building layout, excavation, backfilling, etc.
  - 7. Testing related services.
- B. Related work specified elsewhere includes but may not be limited to:
  - 1. Section 01411: Testing and Inspection
  - 2. Section 02520: Portland Cement Concrete Paving (As noted on the Civil Drawings)
  - 3. Section 03360: Special Concrete Floor Finishes
  - 4. Section 03390: Slabs On Ground (As noted on the Structural Drawings)
  - 5. Section 03600: Non-Shrink Grout

**1.02 RELATED DOCUMENTS**

- A. Unless otherwise shown or specified, the work shall conform to the following standards and recommendations of the American Concrete Institute, latest editions adopted.
 

ACI 117	Standard Specification for Tolerances for Concrete Construction and Materials
ACI 211.1	Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete
ACI 212.2R	Guide for Use of Admixtures in Concrete
ACI 214	Recommended Practice for Evaluation of Strength Test Results of Concrete
ACI 304R	Guide for Measuring, Mixing, Transporting, and Placing Concrete
ACI 304.2R	Placing Concrete by Pumping Methods
ACI 305R	Hot Weather Concreting
ACI 305.1	Specification for Hot Weather Concreting
ACI 306R	Cold Weather Concreting
ACI 306.1	Standard Specification for Cold Weather Concreting
ACI 308	Standard Practice for Curing Concrete
ACI 309R	Guide for Consolidation of Concrete
ACI 315R	Manual of Engineering and Placing Drawing for Reinforced Concrete Structures
ACI 315	Details and Detailing of Concrete Reinforcement
ACI 318	Building Code Requirements for Structural Concrete
ACI 347R	Guide to Formwork for Concrete
- B. Unless otherwise shown or specified, the work shall conform to the following standards of the Concrete Reinforcing Steel Institute.
  - 1. Manual of Standard Practice
  - 2. Placing Reinforcing Bars
- C. REFERENCE DOCUMENTS
  - 1. ACI On-Line Journal, Doc. 99-M49 Alkali-Silica Reaction Mitigation: State of the Art and Recommendations

**1.03 SUBMITTALS TO ARCHITECT OF RECORD**

- A. Reinforcing steel shop drawings shall be provided showing all details of construction, bending and placing, completely dimensioned.
- B. List manufacturers and brand names for cement, admixtures, curing compounds, and materials other than aggregates and reinforcing. Include manufacturer's standard installation instructions and specifications.
- C. All mix designs shall be proportioned in accordance with ACI 318, Section 5.3 and submitted for review to Structural Services, Inc (SSI) via an email attachment of the smallest file size or fax a minimum of three (3) weeks prior to placing, before any concrete is incorporated in the job; if the submittal is a fax, call SSI to notify them. The Architect of Record shall be copied on the submittal to SSI. For developer prepared "pad ready" sites, the submittal shall be made as early



as possible after the Owner has given the Contractor a Notice to Proceed. The Contractor should allow two weeks for the submittal to be reviewed. The mix designs shall be sent via email to:

Jerry Holland, THD@ssiteam.com

SSI Phone Number: 214-552-6438  
SSI Fax Number: 770-234-3870

Once SSI has reviewed the concrete mix design and coordinated any changes with the Contractor/Supplier, they will forward to the Architect of Record via email for Structural review. The Architect of Record will forward the final reviewed copy back to the Contractor. The Contractor shall not proceed with the concrete placement until both SSI and the Architect of Record have reviewed the mix. All mix designs shall be submitted on the Concrete Mix Design Submittal Form included at the end of this specification. Mix design submittals that do not use the Concrete Mix Design Submittal Form will not be reviewed. The Architect of Record will provide the Contractor with an electronic copy of the Concrete Mix Design Submittal Form, in Microsoft Word format, at the time of bid distribution. Mix designs shall be specifically applicable to this project only. Do not submit design mixes not applicable to the project. The submittals shall state which areas and items are to be used for each design mix.

- D. Review of submittals will cover general design only. In no case shall this review relieve the contractor of the responsibility for strength of concrete, general or detailed dimension, quality or quantity of materials, or any other conditions, functions, performance or guarantees required.
- E. Portland Cement: Upon request provide to the Architect of Record, suppliers documentation of environmental policies.

#### 1.04 QUALITY ASSURANCE

- A. It shall be the responsibility of the Contractor to produce concrete of the strength, durability, workability and specified finish.
  - 1. Where tests or past service from the aggregate source show possible aggregate reactivity, steps shall be taken to migrate the concrete mix.
- B. The Owner will employ and pay for the services of an Independent Testing Contractor (ITC) to provide testing and inspection of concrete work.
- C. The services of the ITC, and the information provided by the ITC, are provided for the sole benefit of Owner. The information is provided to Contractor only so the Contractor is aware of what is being reported to Owner. The Contractor shall not, and is not entitled to, rely upon any information provided by the ITC in any manner. Contractor is solely responsible for assuring that the Work complies with the Contract Documents in all respects and may not rely on the ITC for this, or any other, assurance. The ITC and its representatives are not authorized to revoke, alter, relax, enlarge or release any requirements of the Contract Documents, approve or accept any portion of the Work, perform or excuse any duties of Contractor, or be a party to the scheduling of the Work. The ITC is not an authorized agent of the Owner with respect to the relationship between Owner and Contractor.
- D. Concrete materials and operations shall be tested and inspected as the work progresses. Failure to detect any defective work or material shall not in any way prevent later rejection (when such defect is discovered) nor shall it obligate the Owner for final acceptance.
- E. See Section 01411 Testing and Inspection for a complete description of the services to be performed by the ITC and additional Contractor responsibilities to facilitate that work.

#### 1.05 QUALITY CONTROL

- A. All liquid chemical products furnished in this section shall be VOC compliant for building location.

#### 1.06 GUARANTEE

- A. Contractor shall guarantee entire installation for one year, or as specified herein, from date of final acceptance by the Owner.

### PART 2 - PRODUCTS

#### 2.01 CONCRETE MATERIALS

- A. Coarse Aggregate: ASTM C33
- B. Fine aggregate: ASTM C33

**Construction Specification****CAST-IN-PLACE CONCRETE**

- C. Portland cement: ASTM C150, Type I, II, or V. Fly ash or slag not permitted except where noted below, where concrete is in contact with soils having severe or very severe sulfate content and Type V cement is not readily available, or to mitigate concrete against potential aggregate reactivity.
- D. Class F or C fly ash (or Class N pozzolan) per ASTM C 618, except loss on ignition to be 3% maximum.
  - 1. Use of fly ash only permitted for the following conditions:
    - a. In foundation concrete.
    - b. If Type V cement is unavailable or is insufficient to mitigate by itself, then fly ash can be used to mitigate sulfate exposure or as a means of mitigation of potential aggregate reactivity. To mitigate potential aggregate reactivity, the fly ash is to have the following properties
      - i. Maximum 1.5% available alkali
      - ii. Maximum 8% CaO (up to 10% CaO if a minimum replacement of 30% by weight of Type F fly ash is used)
- E. Ground-Granulated-Blast-Furnace Slag (GGBF) per ASTM C 989
  - 1. Use of slag only permitted for the following conditions:
    - a. In foundation concrete.
    - b. If Type V cement is unavailable or is insufficient to mitigate by itself, then slag can be used to mitigate sulfate exposure or as a means of mitigation of potential aggregate reactivity.
  - 2. Slag to have the following properties: Grade 100 or 120
- F. Silica Fume per ASTM C1240
  - 1. Only permitted to mitigate sulfate exposure or as a means of mitigation of potential aggregate reactivity.
  - 2. Silica fume shall be added only in slurry form and well mixed.
- G. Lithium Nitrate Chemical Admixture
  - 1. Only permitted to mitigate sulfate exposure or as a means of mitigation of potential aggregate reactivity.
- H. Water: Clear and free from injurious amounts of oil, acid, alkali, organic or other deleterious matter.
  - 1. Use recycled water when available in accordance with ASTM C94.
- I. Admixtures:
  - 1. Water reducing, and water-reducing retarding admixtures: ASTM C494, Type A may be used at the contractor's option.
  - 2. High-Range Water-Reducing Admixture (Superplasticizer): ASTM C494, Type F or Type G and containing not more than 0.05 percent chloride ions.
    - a. Acceptable Products and Manufacturers
      - i. Euclid Chemical Company: Plastol 341, 5000, 5500 or Eucon 37, 1037
      - ii. Grace Construction Products: Adva 100, 140, 170 or Daracem 100
      - iii. Master Builders Solutions (BASF): MasterGlenium 3030 or MasterRheobuild 1000
  - 3. Non-Chloride, Non-Corrosive Accelerating Admixture: The admixture shall conform to ASTM C494, Type C or E, and not contain more chloride ions than are present in municipal drinking water. The admixture manufacturer must have long-term non-corrosive test data from an independent testing laboratory (of at least a year's duration) using an acceptable accelerated corrosion test method such as that using electrical potential measures.
    - a. Acceptable Products and Manufacturers
      - i. Euclid Chemical Company: Accelguard 80, 90 or NCA
      - ii. Grace Construction Products: Polarset
      - iii. Master Builders Solutions (BASF): MasterSet FP 20
  - 4. Air-entraining admixtures: ASTM C260, for all air-entrained concrete.
  - 5. Maximum chloride ions due to admixtures shall not exceed 0.05% by weight of admixture.
  - 6. The addition of calcium chloride is not permitted.
  - 7. All admixtures shall be used in conformance with the manufacturer's recommendations
  - 8. Admixture Compatibility: When air entraining admixtures, water reducing admixtures, high range water reducing admixtures and non-corrosive accelerating admixtures are used in any combination, all products shall be from the same manufacturer or the Ready-Mix concrete producer shall certify that they are compatible.

**2.02 REINFORCEMENT MATERIALS**

- A. Reinforcing Steel Bars: ASTM A615, Grade 60, unless noted otherwise. All welded reinforcing shall conform to ASTM A706.
- B. Welded Wire Fabric: ASTM A185
- C. Steel Wire: ASTM A82.
- D. Metal Accessories: Include all spacers, ties, chairs and other devices required to properly support and fasten reinforcing steel in place in accordance with the requirements of the ACI Manual of Standard Practice for Detailing Reinforcing Concrete Structures.

**2.03 FORM MATERIALS**

- A. Removable forms shall be wood, metal or other approved material.

**Construction Specification****CAST-IN-PLACE CONCRETE**

- B. Forms for unexposed concrete surfaces may be No. 2 common boards of dimension lumber of uniform thickness.
- C. Earth cuts may be used for forms for footings if soil conditions permit.
- D. Reusable forms shall be used to the greatest extent possible.

**2.04 RELATED MATERIALS**

- A. Curing Materials: Except where specified otherwise, concrete shall be cured using one of the following chemical curing materials.
  - 1. Clear Curing and Sealing Compound: VOC Compliant, Liquid type membrane-forming curing/sealing compound, clear styrene acrylate type, complying with ASTM C1315, Type I, Class A, 25% solids content minimum. Manufacturer's certification is required. Do not apply this material to areas receiving any type of applied finish or coating.
    - a. Dayton Superior: Cure & Seal LV 25% J20 UV
    - b. Euclid Chemical Company: Super Diamond Clear
    - c. Alternative VOC Compliant products and manufacturers (use only where local VOC restrictions prohibit the use of the above listed products, confirm compliance with local authorities):
      - i. Dayton Superior: Cure & Seal 1315 EF
      - ii. Euclid Chemical Company: Super Diamond Clear VOX
  - 2. Dissipating (Removeable) Curing Compound: Use dissipating (removeable) curing compound on surfaces to be covered with finish or coating material applied directly to concrete. Product shall meet ASTM C-309, Type 1. Manufacturer's certification is required.
    - a. Dayton Superior: Clear Resin Cure JIIW
    - b. Euclid Chemical Company: Kurez DR VOX
- B. Premolded Filler: Bituminous fiber type as per ASTM D1751.
  - 1. Acceptable Products:
    - a. W.R. Meadows: Fibre Expansion Joint
- C. Form Ties: Black iron snap ties with a minimum 1-inch breakback.
  - 1. Acceptable Products:
    - a. White Cap: Snap Ties
- D. Form Releasing Agent: Non-staining.
  - 1. Acceptable Products:
    - a. Dayton Superior: Clean Strip J1A
- E. Bonding Admixture:
  - 1. Type: latex, non-rewettable type
  - 2. Acceptable Admixture.
    - a. Dayton Superior: Acrylic Bonding Agent J40
    - b. Euclid Chemical Co.: SBR Latex or Flex-con
    - c. Thoro (BASF): Thorobond
- F. Bonding Compound
  - 1. Type: polyvinyl acetate, re-wettable. For interior use only in areas not subject to moisture.
  - 2. Acceptable Compounds.
    - a. Euclid Chemical Co.: Euco Weld
- G. Epoxy Adhesive
  - 1. Type: two (2) component, 100% solids, and 100% reactive compound suitable for use on dry or damp surfaces.
  - 2. Acceptable Adhesive.
    - a. Dayton Superior: Sure Bond J58
    - b. Euclid Chemical Co.: Euco Epoxy #452 or #620
    - c. Sika Chemical Corp.: Sikadur 32 Hi-Mod
- H. Polymer Repair Mortar:
  - 1. Type: Polymer and microsilica modified cementitious-based compounds.
  - 2. Acceptable Mortar (horizontal).
    - a. Dayton Superior: Thin Resurfacer or Perma Patch FP
    - b. Euclid Chemical Co.: Thin Top Supreme or Concrete Top Supreme
    - c. Sika Chemical Corp.: Sikatop 121 Plus or 122 Plus
  - 3. Acceptable Mortars: (vertical)
    - a. Dayton Superior: Architectural Finish
    - b. Euclid Chemical Co.: Verticoat/Verticoat Supreme

- c. Sika Chemical Corp.: Sikatop Plus 123

### PART 3 - EXECUTION

#### 3.01 PRE-CONCRETE CONFERENCE

- A. At least 7-10 days prior to the start of the concrete construction schedule, the Contractor shall conduct a meeting to review the proposed mix designs and to discuss the required methods and procedures necessary to achieve the required concrete quality. The Contractor shall send a "Pre-concrete Construction Conference Agenda" to all attendees 7 days prior to the scheduled date of the conference. A proposed "Pre-concrete Construction Conference Agenda" is attached to the end of this section for the contractor's consideration.
1. Attendees shall be those designated by the Owner's Representative and the following: A/E, ITC, Contractor, Concrete Supplier (including quality control personnel) and subcontractors for: subgrade preparation, reinforcement, pumping or other means of conveying, placement, finishing, sawing, formwork, or other pertinent portions of the work.
  2. Representatives to be present are personnel who are directly involved in the project and who have authority to control the work.

#### 3.02 CONCRETE PROPORTIONS

- A. When aggregates are known to be reactive by ASTM C 1260, C 1567, C 1293, or C 295, comply with the following for mitigation of concrete for aggregate reactivity (see ACI On-Line Journal, Doc. 99-M49 Alkali-Silica Reaction Mitigation: State of the Art and Recommendations):
1. State Department of Transportation requirements for the state where the project is located.
  2. Department of Transportation requirements for other states where the same aggregate source is used.
  3. Use one or combination of the following materials to limit the expansion to 0.10% at 14 days per ASTM C 1260 or C 1567
    - a. Class F fly ash (or Class N pozzolan): minimum 15%, maximum 30% of cementitious materials by weight
    - b. GGBF slag: minimum 15%, maximum 50% of cementitious materials by weight
    - c. Silica fume: 10% of cementitious materials by weight maximum
    - d. For mixes with a combination of fly ash, GGBF slag and Silica fume, use: 50% replacement of cementitious materials by weight maximum.
    - e. Lithium nitrate: Ensure setting time and finishing characteristics are acceptable.
- B. The specified compressive strength of the concrete, f'c, for each portion of the structure shall be as designated on the drawings. Strength requirements shall be based on 28-day compressive strength.
- C. In cold weather climates, where the coldest average daily low temperature is 32° F or below, concrete exposed to weather in service shall be air-entrained. Air content shall be as indicated in the table below.

**Total Air Content for Frost Resistant Concrete**

Nominal Maximum Aggregate Size (in)	Air Content* %
3/8	7.5
1/2	7
3/4	6
1	6
1 1/2	5.5
2	5
3	4.5

The tolerance on air content as delivered shall be  $\pm 1.5$  percent.

- D. Slump of concrete shall be a maximum of 4"  $\pm$  1" tolerance unless a water-reducing admixture is used. The slump of concrete prior to addition of a water-reducing admixture shall be between 2" and 3". The slump of concrete containing a water-reducing admixture shall not exceed 8". The slump of the concrete shall be determined prior to the addition of the water-reducer and at the point of discharge.
- E. The maximum size of coarse aggregate shall not be more than one-fifth of the narrowest dimension between sides of forms, one-third of the depth of slabs, nor three-fourths of the minimum clear spacing between reinforcing bars.
- F. The maximum coarse aggregate size shall be no. 57 or larger for all foundations, tilt-up panels and concrete not otherwise noted.
- G. Unless noted otherwise, the minimum cement content for all concrete shall be 470 lb/yd<sup>3</sup> or the minimum amount necessary to produce the specified compressive strength, f'c. Concrete proportions shall conform to the requirements established on the structural drawings. For many mixes, the maximum w/c ratio will control the mix design and cement content. The most stringent requirement shall apply.
- H. Water/Cement Ratio: Concrete in contact with soils shall have the maximum w/c ratio established on the structural drawings as it relates to the sulfate content of the soil.

1. All concrete exposed to freezing and thawing in a moist condition or to deicing chemicals shall have a maximum w/c ratio of 0.45 ( $f'c = 4500$  psi at 28 days).
- I. Concrete shall be proportioned by either the trial batch method or the field experience method.
  1. Where the trial batch method is used, make three test cylinders for each trial batch. Break one cylinder at 7 days and two at 28 days to verify strength requirements. Adjust proportions to produce a design mix at least 1200 psi greater than the specified strength,  $f'c$ .
  2. Where the field experience method is used, the required average compressive strength shall be determined in accordance with paragraph 5.3.2 of ACI 318. Documentation that proposed concrete proportions will produce an average compressive strength equal to or greater than the required average compressive strength shall consist of a field strength test record representing materials and proportions to be used for this project. A field strength test record shall consist of at least 10 consecutive tests encompassing a period of time of not less than 45 days and made within the past 18 months.

### 3.03 FORMWORK

- A. Forms shall be used, wherever necessary, to confine the concrete and shape it to the required dimensions. Forms shall have sufficient strength to withstand the pressure resulting from placement and vibration of the concrete, and shall have sufficient rigidity to maintain specified tolerances.
- B. The design and engineering of the formwork, as well as its construction, shall be the responsibility of the contractor.
- C. Forms shall be sufficiently tight to prevent loss of mortar from the concrete.
- D. All exposed concrete corners shall have a  $3/4"$  x  $3/4"$  chamfer, except as otherwise noted.
- E. Form ties shall be broken off 1" or more back from concrete surfaces. No wire or strap ties will be permitted. Ties shall be of sizes and weights as required for pressures developed, and installed in accordance with manufacturer's recommendations.
- F. Forms for exposed surfaces shall be coated with non-staining releasing agent, applied before the reinforcing steel is placed.
- G. Forms shall not be disturbed until the concrete has adequately hardened. Care shall be taken to avoid spalling the concrete surfaces.
- H. All surfaces of forms and embedded materials shall be cleaned of any accumulated mortar or grout from previous concreting and of all other foreign material before concrete is placed in them.

### 3.04 REINFORCEMENT

- A. Fabrication:
  1. Reinforcing steel shall be accurately fabricated to the dimensions shown.
    - a. Bends shall conform to bend dimensions defined as standard in accordance with details in the ACI Detailing Manual (SP-66) and/or CRSI Manual of Standard Practice, unless otherwise shown.
    - b. Bars shall be bent cold, and shall not be bent or straightened in a manner that will injure the material.
    - c. Bars shall be fabricated within the tolerances shown in the ACI Detailing Manual (SP-66) and/or CRSI Manual of Standard Practice.
  2. Welding as an aid to fabrication and/or installation will not be permitted except as specifically shown on the drawings or as authorized by the Engineer of Record.
- B. Placing
  1. Position reinforcement to the tolerances established in ACI 117. For the longitudinal direction, the tolerance in uniform spacing of reinforcing steel is plus or minus 2 inches. In concrete depths 8 inches or less, reinforcing location shall not deviate more than  $3/8$  of an inch. For concrete depths greater than 8 inches, reinforcing location shall not deviate more than  $1/2$  of an inch. Also, maintain the required clearances not in the specifications, but established on the plans. The Contractor should review and be familiar with ACI 117.
  2. Unless noted otherwise, reinforcing shall be placed to the concrete cover shown on the drawings.
  3. It shall be the Contractors responsibility to ensure that the intended reinforcement location is maintained during concrete placement. Tie bars at intersections with soft steel wire.
  4. Lap splices of reinforcing shall be as called for on the drawings.
  5. Lap all bars at all corners and abrupt changes in direction of walls. Provide steel dowels between footings and walls, pilasters, columns and elsewhere, as indicated on drawings and/or as conditions require.
  6. Do not drive nails into wood forms to support reinforcement.
  7. Provide reinforcing bars around all openings and at all re-entrant corners in slabs and concrete walls, as detailed on the drawings.
  8. Reinforcing bars partially embedded in concrete shall not be field bent.
- C. Cleaning and Protection:

1. Protect reinforcement from excessive rusting or mechanical injury. Store on skids or otherwise maintain at least 6 inches above ground.
2. After bars are tied in place take whatever precautions are necessary to protect bars from damage by construction equipment or careless workmen. Pay particular attention to bars projecting out of previously placed concrete. Damaged steel shall be replaced at no cost to Owner.

### 3.05 PRODUCTION OF CONCRETE

- A. Ready-mixed concrete shall be batched, mixed and transported in accordance with ASTM C94. The ready-mixed concrete producer shall furnish duplicate delivery tickets, one for the Contractor and one given to the Owner's Representative, for each batch of concrete. The information provided on the delivery ticket shall include the quantities of all materials batched including the amount of free water in the aggregate. The quantity of water that can be added at the site without exceeding the maximum water cement ratio specified shall be noted on the delivery ticket.
- B. For job mixed concrete, mixing shall be done in a batch mixer of approved type. The mixer shall be rotated at a speed recommended by the manufacturer and mixing shall be continued for 1-1/2 minutes after all materials are in the drum. For batches larger than 1 cubic yard, mixing time shall be increased 15 seconds for each additional cubic yard or fraction thereof. All concrete shall be mixed until there is a uniform distribution of the materials and shall be discharged completely before the mixer is recharged.
- C. The Owner's ITC shall have access at all times to the batching and mixing plant for sampling of materials and inspection of all work performed for this job.
- D. In cold weather, the temperature of the concrete when delivered at the site of the work shall be at least 50 degrees F.
- E. In hot weather the ingredients shall be cooled before mixing, or flake ice or well-crushed ice of a size that will melt completely during mixing may be substituted for all or part of the mixing water if, due to high temperature, low slump, flash set or cold joints are encountered. When air temperature is between 80F and 90F, reduce maximum mixing and delivery time from 1-1/2 hours to 75 minutes. When air temperature exceeds 90F, reduce maximum mixing and delivery time to 60 minutes. Reject any concrete that has a temperature at point of placement above 90°F, unless approved otherwise by the Home Depot Project Manager.

### 3.06 PLACING

- A. Preparation for Placing Concrete
  1. All bearing material shall be inspected by the geotechnical engineer prior to placement of concrete. The geotechnical engineer shall be the sole judge as to the suitability of the bearing material.
  2. Before concrete is placed, all debris and ice shall be removed from the spaces to be occupied by the concrete. Remove surplus form releasing agent from the contact face of forms. Forms and the reinforcement shall be thoroughly cleaned of ice or other coatings.
  3. Water, mud, snow and ice shall be removed from place of deposit before concrete is placed. Concrete shall not be placed on frozen ground.
  4. Notify all trades concerned and the Owner's Representative sufficiently in advance of the scheduled time for concrete placement to permit installation of all required work by other trades.
  5. Before placing concrete, all required embedded items, including dovetail anchor slots, anchors, inserts, curb angles, metal frames, fixtures, sleeves, drains, stair nosings, accessory devices for Mechanical and Electrical installations shall be properly located, accurately positioned and built into the construction, and maintained securely in place.
  6. Build into construction all items furnished by the Owner and other trades. Provide all offsets, pockets, slabs, chases and recesses as job conditions require.
  7. Set anchor bolts furnished under the Structural Steel Section of these specifications.
  8. Place and properly support reinforcing steel.
- B. Conveying
  1. Concrete shall be conveyed from the mixer to the place of final deposit by methods that will prevent separation or loss of material.
  2. Equipment for chuting, pumping, and pneumatically conveying concrete shall be of such size and design as to insure a practically continuous flow of concrete at the delivery without separation of material.
  3. Provide runways or other means for wheeled equipment to convey concrete to point of deposit. Construct runways so that supports will not bear upon reinforcement or fresh concrete.
- C. Depositing
  1. Concrete shall be deposited as nearly as practicable in its final position to avoid segregation due to re-handling or flowing. No concrete shall have a free fall of over three feet from truck, mixer or buggies. The concreting shall be carried on at such a rate that the concrete is at all times plastic and flows readily into the spaces between the bars. No concrete that has partially hardened or been contaminated by foreign materials shall be deposited in the work, nor shall re-tempered concrete be used.
  2. When concreting is started, it shall be carried on as a continuous operation until the placing of the section is completed.
  3. All concrete shall be thoroughly consolidated by mechanical vibrators during the placing operation and shall be thoroughly worked around the reinforcement and embedded fixtures and into the corners of the forms. Mechanical vibrators shall be applied directly to the concrete and used only under experienced supervision. Vibrators shall not

- be secured to forms or reinforcement. Compaction shall be carried on continuously with the placing of concrete. Keep a minimum of two vibrators on the job during concreting operations.
4. Protect adjacent surfaces from concrete drippings, spillage and splashes. Hardened or partially hardened splashes or accumulations of concrete on forms or reinforcement shall be removed before the work proceeds. Clean all damaged surfaces immediately.
  5. All conveyances shall be thoroughly cleaned at frequent intervals during the placing of the concrete, and before beginning a new run of concrete all hardened concrete and foreign materials shall be removed from the surfaces.
  6. The superintendent or foreman in charge of concrete work shall mark on the drawings the time and date of the placing of the concrete in the batches from which concrete test cylinders are made shall also be recorded on these drawings. Such drawings shall be kept on file at the job until its completion and shall be subject to the inspection of the Owner's Representative at all times.

### 3.07 FINISHES

- A. Smooth-Form Finish (point & patch)
  1. Smooth-form finish shall be produced by filling smoothly all tie holes, honeycomb and other depressions, knocking off and removing burrs and form marks exceeding 1/8" in height.
  2. Smooth-form finish shall be confined to concrete surfaces which will be covered by other construction and which will not be visible unless otherwise noted by Architect of Record.
- B. Rubbed Finish
  1. Exposed concrete surfaces designated by the Architect of Record including beams, columns, exterior retaining walls, and soffits of stair slabs shall receive a rubbed finish immediately after removal of forms.
  2. Carefully remove all concrete fins and laitance; rub smooth with Carborundum brick. In general, one rubbing with coarse stone should be sufficient for working uneven patched surface. Final rubbing with fine stone, if required, shall be after curing and immediately before cleaning. Removal of curing compound with mineral spirits may be required.
  3. All exposed concrete surfaces which are not to be painted shall be cleaned as follows: Mix one part white Portland cement and 1-1/2 parts sand with water to consistency of thick paint. Thoroughly wet surfaces and brush on grout uniformly, completely filling air bubbles and holes. Immediately flatten and vigorously scour with wood float. Finish and remove excess grout with sponge rubber float as soon as grout is stiff enough so as not to be pulled from holes and depressions. When thoroughly dry, remove visible dried grout film by vigorously rubbing with burlap. Entire cleaning operation for any area shall be completed the day it is started. The final finish shall be uniform in color and monolithic in appearance.
  4. Concrete surfaces to be painted shall be cleaned and prepared according to the manufacturer's recommendations for the specified paints.
  5. Exposed soffits of floor slabs shall have all fins, holes, honeycombs and other rough areas removed and filled. Areas to receive acoustical plaster do not receive any Carborundum rubbing.
- C. Related Unformed Surfaces:
  1. Strike flush and float tops of walls, curbs, horizontal offsets and similar unformed surfaces to obtain texture consistent with that of adjacent formed surfaces.
  2. If adjacent formed surfaces are to receive smooth finish, continue final finishing operation across tops of related unformed surfaces. Provide monolithic finish to interior curbs by stripping forms while concrete is still green and steel-troweling surfaces to hard, dense finish with corners, intersections and terminations slightly rounded.

### 3.08 CURING AND PROTECTION

- A. See Section 03390 for additional information for slabs on ground.
- B. General Requirements for Curing: Prevent surfaces of concrete from drying out in excessive cold or hot temperature. Maintain concrete without drying and above 50° F for seven (7) days after placement. Start curing process immediately after final finishing or initial set of concrete. Freshly placed concrete shall be protected against wash by rain.
- C. Moisture loss from surfaces placed against wooden forms or metal forms exposed to heating by the sun, shall be minimized by keeping the forms wet until they can be safely removed. After form removal apply curing compound in accordance with the recommendations of the manufacturer. For any surface against which additional concrete or other material is to be bonded, unless it is proven that the curing compound will not prevent bond, positive measures shall be taken to remove it completely from areas to receive bonded applications.
- D. Temperature, Wind, and Humidity
  1. Cold weather - when the mean daily outdoor temperature is less than 40° F, the temperature of the concrete shall be maintained between 50° and 70° F for the required curing period. When necessary, arrangements for heating, covering, insulating, or housing the concrete work shall be made in advance of placement and shall be adequate to maintain the required temperature without injury due to concentration of heat. Combustion heaters shall not be used during the first 24 hours unless precautions are taken to prevent exposure of the concrete to exhaust gases that contain carbon dioxide.
  2. Hot weather - When necessary, provision for windbreaks, shading, fog spraying, sprinkling, ponding, or wet covering with a light colored material shall be made in advance of placement, and such protective measures shall be taken as quickly as concrete hardening and finishing operations will allow.

**Construction Specification****CAST-IN-PLACE CONCRETE**

3. Rate of temperature change - Changes in temperature of the air immediately adjacent to the concrete during and immediately following the curing period shall be kept as uniform as possible and shall not exceed 5° F in any 1 hour or 50° F in any 24 hour period.
- E. Protection from mechanical injury - During the curing period, the concrete shall be protected from damaging mechanical disturbances, such as load stresses, heavy shock, and excessive vibration. All finished concrete surfaces shall be protected from damage by construction equipment, materials, or methods, by application of curing procedures, and by rain or running water. Self-supporting structures shall not be loaded in such a way as to overstress the concrete.
- F. Contractor to remove curing compounds (if used) per the manufacturer's recommendations after curing is complete as required to ensure compatibility of any finish treatments, paints, or coatings.

**3.09 SURFACE CONDITION**

- A. Surface to receive bonding agent shall be structurally sound and clean of material, which reduces bond.

**3.10 PATCHING CONCRETE**

- A. Concrete will be considered by the Owner's ITC as not conforming to the intent of the Drawings and Specifications for the following reasons:
  1. Concrete which is not formed as shown on the Drawings;
  2. Concrete which is not in true alignment or level;
  3. Concrete which exhibits a defective surface or;
  4. Concrete with defects that reduce the structural integrity of a member or members.
- B. Areas requiring patching shall not exceed two sq. ft. per 1000 sq. ft. of surface area and shall be widely dispersed. Areas showing excessive defects as determined by Owner's ITC shall be removed and replaced as directed by the Owner.
- C. Nonconforming concrete will be rejected by the Owner and shall be removed and replaced with concrete, which conforms to Contract requirements without a claim, by the Contractor for additional cost or extension of contract time.
- D. Should the Owner grant permission for the Contractor to attempt restoration of a defective area by patching, such permission shall not be considered a waiver of the Owner's right to require complete removal of the defective area if, in the Architect of Record or Owner's opinion, the patching does not restore the quality and appearance of the concrete surface or if patching does not provide the structural integrity of the member or members.
- E. Immediately after removing forms, inspect all concrete surfaces. Patch joints, tie holes, voids, honeycombs, stone pockets and other defective areas permitted by the Owner.
- F. With prior approval of the Architect of Record and Owner, all repairs of defective areas shall conform to ACI 301, Section 5.3.7.
- G. All honeycombed and other defective concrete shall be removed down to sound concrete. If chipping is necessary, the edges shall be perpendicular to the surface or slightly undercut. No feathered edges will be permitted. The area to be patched and an area at least 6 inches wide surrounding it shall be dampened to prevent absorption of water from the patching mortar. A bonding grout shall be prepared using a mix of approximately 1 part cement to 1 part fine sand passing a No. 300 mesh sieve, mixed to the consistency of thick cream, and then well brushed into the surface. In lieu of this bonding grout, the Contractor may use the Bonding Admixture, Bonding Compound, or Epoxy Adhesive specified. Use the product most applicable to the patch location and moisture exposure. Follow the manufacturers surface preparation and application recommendations.
- H. The patching mixture shall be made of the same materials and of approximately the same proportions as used for the concrete, except that the coarse aggregate shall be omitted and the mortar shall consist of not more than 1 part cement to 2-1/2 parts sand by damp loose volume. White Portland cement shall be substituted for a part of the gray Portland cement on exposed concrete in order to produce a color matching the color of the surrounding concrete, as determined by a trial patch. The quantity of mixing water shall not be more than necessary for handling and placing. The patching mortar shall be mixed in advance and allowed to stand with frequent manipulation with a trowel, without addition of water, until it has reached the stiffest consistency that will permit placing.
- I. After surface water has evaporated from the area to be patched, the bonding grout, bonding admixture, bonding compound, or epoxy adhesive shall be applied to the surface. When the re-wettable bonding compound is dry or the other bonding material is still tacky, the premixed patching mortar shall be applied. The mortar shall be thoroughly consolidated into place and struck off so as to leave the patch slightly higher than the surrounding surface. To permit initial shrinkage, it shall be left undisturbed for a least 1 hour before being finally finished. The patched area shall be kept damp for seven (7) days. Metal tools shall not be used in finishing a patch in a formed wall, which will be exposed.
- J. When color match of the adjacent concrete is not required, a Polymer Repair Mortar may be used, with the prior approval of the Architect of Record and Owner, in lieu of the jobsite mix repair mortar. The Contractor shall follow the manufacturer's recommendations for surface preparation, mixing, placing, and curing the patch materials.



- K. Leveling of floors for subsequent finishes shall not be permitted. Materials that do not conform shall be removed & replaced at no additional cost to the owner or extension of contract time.

### 3.11 CLEANING UP

- A. During the progress of the work, the premises shall be kept free of debris and waste. Upon completion, remove from the site and dispose of all debris and surplus materials in a lawful manner.
- B. At completion of work, touch-up minor damage to adjacent construction and prefinished surfaces to the satisfaction of the Architect of Record. Replace materials damaged or stained during installation. Protect completed work until final acceptance by Owner.

### 3.12 EVALUATION AND ACCEPTANCE OF CONCRETE

- A. Test results for standard molded and standard cured test cylinders shall be evaluated separately for each specified concrete mix design. Such evaluation shall be valid only if tests have been conducted in accordance with the specifications.
- B. For evaluation, each specified mix design shall be represented by at least five tests.
- C. The strength level of the concrete will be considered satisfactory so long as the averages of all sets of three consecutive strength test results equal or exceed the specified strength,  $f_c$ , and no individual strength test result falls below the specified strength,  $f_c$ , by more than 500 psi. Should cylinder tests fail to meet these requirements or if deficient construction is suspected by Owner's Representative, core tests may be required and the cost of such tests shall be paid by the Contractor.
- D. Testing by impact hammer, sonoscope, or other nondestructive device may be used to determine relative strengths at various locations in the structure as an aid for selecting areas to be cored. Such tests shall not be used as a basis for acceptance or rejection.
- E. Where core tests are required, the Owner's ITC shall first identify the locations of the reinforcing steel in the area of the proposed core by using a pachometer (rebar locator). Cores at least 2 inches in diameter shall be obtained without cutting or damaging any reinforcing steel, and tested in accordance with "Methods of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete" (ASTM C42). The cores shall be air dried (temperature 60 to 80 F, relative humidity less than 60 percent) for 7 days before test and shall be tested dry.
- F. At least three representative cores shall be taken from each member or area of concrete in place that is considered potentially deficient. The location of cores shall be determined by the Owner's Representative so as least to impair the strength of the structure. If, before testing, one or more of the cores shows evidence of having been damaged subsequent to or during removal from the structure, it shall be replaced.
- G. Concrete in the area represented by a core test will be considered adequate if the average strength of the cores is equal to at least 85 percent of and if no single core is less than 75 percent of the specified strength,  $f_c$ .
- H. Core holes shall be repaired as directed by the Owner's Representative.

### 3.13 ACCEPTANCE OF STRUCTURE

- A. Completed concrete work, which meets all applicable requirements, will be accepted without qualification.
- B. Completed concrete work which fails to meet one or more requirements but which has been repaired to bring it into compliance will be accepted without qualification.
- C. Completed concrete work which fails to meet one or more requirements and which cannot be brought into compliance may be accepted or rejected by the Owner's Representative. In this event, modifications may be required to assure that remaining work complies with the requirements.
- D. The cost of any additional tests or analysis, including additional architectural and engineering services, performed to prove the adequacy of the concrete work, shall be borne by the contractor without extension of contract time.

### 3.14 ATTACHMENTS

- A. The following attachments are part of this section.
  - 1. Concrete Mix Design Submittal Form
  - 2. Pre-Concrete Construction Conference Agenda

END OF SECTION

Attachments:

Concrete Mix Design Submittal Form  
Pre-Concrete Construction Conference Agenda

**Construction Specification****CONCRETE MIX DESIGN SUBMITTAL FORM****CONCRETE MIX DESIGN SUBMITTAL FORM**

NOTES: 1) Fill in all blank spaces. Use -0- (zero) or N.A. (not applicable) where appropriate.  
 2) Submit separate form for each mix design

Project: \_\_\_\_\_ Project Location  
 and Store Number: \_\_\_\_\_

General Contractor: \_\_\_\_\_

Mix Design No.: \_\_\_\_\_ Strength: \_\_\_\_\_ psi; at \_\_\_\_\_ days

Use (i.e., slab on ground, suspended  
 slab., etc.) \_\_\_\_\_

**A. DESIGN MIX INFORMATION**

Based on: Field Experience \_\_\_\_ or Trial Mix Test Data \_\_\_\_ (Attach laboratory test data)

Density:

Wet: \_\_\_\_\_ pcf

Dry: \_\_\_\_\_ pcf

Slump \_\_\_\_ in. (+ \_\_\_\_ in., - \_\_\_\_ in.) BEFORE adding mid-range water-reducer

Slump \_\_\_\_ in. (+ \_\_\_\_ in., - \_\_\_\_ in.) AFTER adding mid-range water-reducer

Air: \_\_\_\_% (+ \_\_\_\_%, - \_\_\_\_%)

**MATERIALS**

Aggregates	(C33 size designation; material; type; source; fine aggregate fineness modulus)
Coarse No. 1	
Coarse No. 2	
Coarse No. 3	
Fine No. 1	
Fine No. 2	

Cementitious Materials	Type	Product-Manufacturer (Source)
Cement (Incl. C3A Content)		
Fly Ash		
Slag		
Silica Fume		
Other		

Admixtures	Type	Product-Manufacturer (Source)
Air Entraining Agent		
Low Range Water Reducer		
Mid-Range Water Reducer		
Non-Corrosive Accelerator		
Other		

**Construction Specification****CONCRETE MIX DESIGN SUBMITTAL FORM**

Fibers	Type and Size	Product-Manufacturer (Source)	Dosage (lb./cy)
Polypropylene			

**B. FINAL MIX DESIGN DATA:**

Mix Proportions <sup>1</sup>				
	Identification	Weight (lb.)	Specific Gravity	Absolute Vol. (cu. ft.)
Cement				
Coarse Agg. No. 1				
Coarse Agg. No. 2				
Coarse Agg. No. 3				
Fine Agg. No. 1				
Fine Agg. No. 2				
Water <sup>2</sup>				
Air Content				
Other				
Totals				1 CY

**Notes:**

1. Proportions per cubic yard.
2. Includes free water contained on aggregates

Coarse & Fine Aggregate Gradation (% Passing on Each Sieve)					
Sieve	Coarse Agg. No. 1	Coarse Agg. No. 2	Coarse Agg. No. 3	Fine Agg. No. 1	Fine Agg. No. 2
1-1/2"					
1"					
3/4"					
1/2"					
3/8"					
No. 4					
No. 8					
No. 16					
No. 30					
No. 50					
No. 100					
No. 200					

**Construction Specification****CONCRETE MIX DESIGN SUBMITTAL FORM**

Combined Coarse & Fine Aggregate Gradation (% Retained on Each Sieve)						
Sieve	Coarse Agg. No. 1	Coarse Agg. No. 2	Coarse Agg. No. 3	Fine Agg. No. 1	Fine Agg. No. 2	Combined %
1-1/2"						
1"						
3/4"						
1/2"						
3/8"						
No. 4						
No. 8						
No. 16						
No. 30						
No. 50						
No. 100						
No. 200						

Ratios	
$\frac{\text{Water (lb.)}}{\text{Cement (lb.)}} =$	
$\frac{\text{Fine Aggregates (lb.)}}{\text{Total Aggregates (lb.)}} =$	

ADMIXTURES
Air Entraining ____ oz.
Low-Range Water-Reducer ____ oz.
Mid-Range Water-Reducer ____ oz.
Non-corrosive accelerator ____ oz.
Other: ____ oz.

STANDARD DEVIATION ANALYSIS (from field experience records):

Number of Test Cylinders Evaluated: \_\_\_\_ Standard Deviation: \_\_\_\_

 $f_{cr} = f'_c + 1.34k_s$  or  $f_{cr} = f'_c + 2.33k_s - 500$  (whichever is larger)

(Refer to ACI 301 for increased deviation factor (k) when less than 30 tests are available.)

**C. LABORATORY TEST DATA (HARDENED CONCRETE):**

Age (days)	Mix No. 1 (comp. str.)	Mix No. 2 (comp. str.)	Mix No. 3 (comp. str.)
7			
7			
28			
28			
28 Day Average Compressive Strength:			psi

Mix design proportioned to achieve  $f_{cr} = f'_c + 1200$  psi

Remarks:

**D. REQUIRED CURRENT ATTACHMENTS**

- \_\_\_\_\_ Plant certification documentation by NRMCA (certification and checklist) or by State Department of Transportation (for both primary & secondary plants)
- \_\_\_\_\_ Coarse aggregate gradation tests for each size group (all sieves)
- \_\_\_\_\_ Fine aggregate gradation reports for each size group
- \_\_\_\_\_ Combined coarse and fine aggregate gradation report and graph
- \_\_\_\_\_ Reports of possible reactivity of aggregate based on past service
  - \_\_\_\_\_ Has there ever been a positive test result for reactivity? (Select one answer)    Yes    No
  - \_\_\_\_\_ If yes, provide aggregate test results from ASTM C 1260, C 1567, C 1293, or C 295
- \_\_\_\_\_ Reports of possible aggregate pop-outs or other disruptions based on past service
  - \_\_\_\_\_ Has there ever been a positive test result for pop-outs or other disruptions?    Yes    No
- \_\_\_\_\_ Cement test reports
- \_\_\_\_\_ Concrete compressive strength data used for standard deviation calculations
- \_\_\_\_\_ Admixture compatibility certification letter

Submitted By: \_\_\_\_\_

Concrete Supplier: \_\_\_\_\_

Technical Contact Name:	_____	& Tel. Nos. _____
Sales Contact Name:	_____	& Tel. Nos. _____
Company Name:	_____	
Address:	_____	
	_____	
Other Tel. Nos.:	_____	
Date:	_____	
Main Plant Location:	_____	
Miles from Project:	_____	
Approved by NRMCA & DOT	_____	(Yes or No)
Type (Dry ,Central)	_____	
Secondary Plant Location:	_____	
Miles from Project:	_____	
Approved by NRMCA & DOT	_____	(Yes or No)
Type (Dry ,Central)	_____	



## **PRE-CONCRETE CONSTRUCTION CONFERENCE AGENDA**

### **1. SCHEDULE/SEQUENCE**

#### **A. CHECKLIST**

- 1) WHO IS RESPONSIBLE FOR COMPLETION

### **2. TEST SLAB PLACEMENT CONSIDERATIONS**

#### **A. WHERE IS IT TO BE LOCATED?**

#### **B. ALL MATERIALS TO BE SAME AS FINAL SLAB (INCLUDING EVAPORATION RETARDANT)**

#### **C. TEST SLAB TESTING**

- 1) MICROWAVE TEST FOR WATER CONTENT (BY CONCRETE SUPPLIER FIRST, THEN BY OWNER'S ITC)
- 2) WASH-OUT TEST FOR AGGREGATE SIEVE ANALYSIS

### **3. FIRST MAJOR PLACEMENT CONSIDERATIONS**

#### **A. WILL APPROPRIATE PEOPLE BE THERE?**

#### **B. INCORPORATE LESSONS LEARNED FROM TEST SLAB PLACEMENT**

### **4. CONCRETE MIX REVIEW**

#### **A. AGGREGATES**

#### **B. SLUMP AND WATER**

- 1) CONTROLLING WATER (FIELD ADDITION, WASHOUT, ETC.), REJECTION CRITERIA, ETC.

#### **C. ADMIXTURES**

#### **D. TEMPERATURE REQUIREMENTS / ENVIRONMENT**

- 1) CAN MAXIMUM CONCRETE TEMPERATURE OF 90°F BE MET?
- 2) SPECIAL HOT WEATHER REQUIREMENTS NEEDED?
- 3) SPECIAL COLD WEATHER REQUIREMENTS NEEDED?

#### **E. TESTING**

- 1) AIR, SLUMP, TEMPERATURE, ETC. (ADDITIONAL AIR AND SLUMP TESTING)
- 2) FREQUENCY
- 3) WASHOUT AND MICROWAVE TESTING IF REQUIRED

### **5. SUBGRADE & BASE**

- A. WHO IS RESPONSIBLE FOR EACH
- B. TYPE OF MATERIALS
- C. PROTECTION FROM WEATHER AND TRAFFIC
- D. MOISTURE CONTROL
- E. SURFACE TOLERANCES
  - 1) MINIMAL RUTTING, PLANAR, ETC.
- F. TESTING
  - 1) PROOF-ROLLING SUBGRADE, BASE, ETC

**6. FORMWORK, BULKHEADS, BLOCK-OUTS & PENETRATIONS**

- A. EMBEDS
  - 1) COORDINATION WITH FLOOR JOINTS
- B. RE-ENTRANT CORNER AVOIDANCE
- C. PENETRATIONS AND BLOCK-OUTS
  - 1) LOCATION, ISOLATION AND ADDITIONAL REINFORCEMENT
- D. SLAB ISOLATION FROM FOUNDATIONS, ANCHOR BOLTS, ETC.
- E. "LASER FORM" BY GREANSTREAK NOT PERMITTED
- F. STRIPPING
  - 1) PROTECT EDGES
  - 2) APPLY HIGH-SOLIDS CURING COMPOUND ON EDGES IMMEDIATELY AND NOT ON TOP OF SLAB

**7. REINFORCEMENT**

- A. PLACEMENT
- B. SUPPORTS
- C. LOCATION / PROPER COVER
- D. RE-ENTRANT CORNER BARS
- E. INSPECTION

**8. JOINTS**

- A. CONSTRUCTION JOINT LOCATIONS AND RADIUS ON SIDE OF JOINT PLACED LAST
- B. PERIMETER JOINTS
- C. DOWEL BASKET & DIAMOND DOWEL INSTALLATION
  - 1) DIAMOND DOWEL ALIGNMENT VERIFIED WITH TEMPLATE
- D. ARMORED JOINTS / EDGES
- E. SOFF-CUT SAW / BLADES AND SKID-PLATES

**9. MIXING / PLACEMENT / COMPACTION EQUIPMENT AND PROCEDURES**

- A. BACK-UP CONCRETE PLANT
- B. DISPATCHING AND CONCRETE TRUCK ROUTING
  - 1) CONCRETE SUPPLIER Q/C REP ON SITE?
- C. TRUCK INSPECTION
  - 1) FIRST BY CONCRETE SUPPLIER
  - 2) SECOND BY OWNER'S ITC (3 DAYS MAXIMUM BEFORE FIRST PLACEMENT)
  - 3) ONLY APPROVED TRUCKS ALLOWED ON SITE
- D. TYPE OF EQUIPMENT TO BE USED
- E. SIZE OF PLACEMENTS
- F. METHOD OF TRANSPORTING CONCRETE FROM TRUCK IF OTHER THAN TAIL-GATING

**10. FINISHING**



- A. EQUIPMENT AND TOOLS
- B. PROCEDURES
- C. TIMING
- D. SURFACE APPEARANCE REQUIREMENTS
- E. EVAPORATION CONTROL / RETARDANT

**11. CURING**

- A. MATERIALS (SPECIFIED AND ALTERNATE)
- B. METHODS
- C. TIMING
- D. COORDINATION WITH TILT-UP WALLS AND OTHER TRADES
- E. PROTECTION (TRAFFIC, TILT-UP WALLS, ETC.)

**12. TOLERANCE TESTING**

- A. TIMING
- B. PROCEDURE
- C. DISTRIBUTION OF RESULTS
- D. EVALUATION OF RESULTS

**13. EMERGENCY PLANNING**

- A. EQUIPMENT BREAKDOWN
  - 1) SAWS, LASER SCREED, VIBRATORS, ETC.
- B. INCLEMENT WEATHER

**14. EXTERIOR SLABS AND PAVEMENTS**

- A. AIR-ENTRAINMENT
- B. SURFACE FINISH REQUIREMENTS

**15. CLEAN UP / MISC.**

- A. WHEELED EQUIPMENT PROHIBITED FROM SLAB UNTIL COMPLETION OF CURING PERIOD
- B. WHEELED EQUIPMENT TO BE DIAPERED AND HAVE NON-MARKING TIRES
- C. DROP CLOTHS TO BE USED BELOW PARKED EQUIPMENT

**Construction Specification****SPECIAL CONCRETE FLOOR FINISHES****PART 1 - GENERAL****1.01 SCOPE OF WORK**

- A. The Contractor shall provide all labor, material, appliances, and accessories necessary to complete the work. This section includes the following:
  - 1. Cleaning, liquid surface treatment application and burnishing concrete to specified finish and appearance level.
- B. Related work specified elsewhere includes but may not be limited to:
  - 1. Section 01200: Project Meetings
  - 2. Section 01411: Testing and Inspection
  - 3. Section 03300: Cast-In-Place Concrete
  - 4. Section 03390: Slab on Ground
  - 5. Section 07901: Joint Sealers/Fillers

**1.02 SUBMITTALS**

- A. Product Data:
  - 1. Submit product data for all brushes and pads prior to beginning cleaning and burnishing to verify pad and brush texture.
  - 2. Submit Liquid Surface Treatment material
- B. Liquid Surface Treatment Applicator Qualifications:
  - 1. Provide letter of certification from liquid surface treatment manufacturer referencing project name and store number that states that applicator is a certified applicator of the product in good standing and is familiar with the proper manufacturer's procedures and installation requirements.
  - 2. Provide list of a minimum of 5 projects performed within the last year of similar type, size and complexity as this contract. If requested, provide project Owner information including phone number of Owner's contact for each project.
- C. Provide name and qualifications of technically qualified liquid surface treatment manufacturer's field representative for approval.
- D. Submit Product Data, Applicator Qualifications and Manufacturer's Field Representative for review to thd@ssiteam.com.

**1.03 QUALITY ASSURANCE (BY CONTRACTOR)**

- A. Certified Applicator: All General Contractors bidding or negotiating a Home Depot project shall contact the liquid surface treatment manufacturer to obtain a list of Certified Applicators and Distributors located within the geographic region of the project. General Contractors shall solicit and accept pricing only from those Certified Applicators and Distributors as included in the Manufacturer's list and approved by Owner's Representative.
- B. The approved field representative of the liquid surface treatment manufacturer shall be onsite during the initial application of the liquid surface treatment and periodic observations during remainder of the applications.
- C. The approved liquid surface treatment representative shall ensure that the correct amount of liquid surface treatment is onsite and in numbered, sealed containers prior to commencement of work.
- D. Applicator Qualifications:
  - 1. Ensure applicator is Certified as noted above.
  - 2. Ensure applicator experience is as noted above.
  - 3. Provide an adequate number of skilled workmen who are thoroughly trained and experienced in the necessary craft.
  - 4. All Applicator's personnel shall be familiar with the specified requirements and the methods needed for proper performance of work of this section.
- E. Protection:
  - 1. No satisfactory chemical or cleaning procedure is available to remove petroleum, rust, and other stains from the concrete surface. Prevention is therefore essential.
    - a. Diaper all hydraulic powered equipment to avoid staining of the concrete.
    - b. Allow no trade to park vehicles on the inside slab. If necessary to complete their scope of work, place drop cloths under vehicles at all times.
    - c. Do not allow pipe cutting machines to be used on the inside floor slab.
    - d. Do not allow steel placed on interior slab to cause rust stains.
    - e. Do not allow acids and acidic detergents to come into contact with slab.
    - f. Do not allow paint to come into contact with slab.

**Construction Specification****SPECIAL CONCRETE FLOOR FINISHES**

- g. Ensure vehicles and equipment used on slabs have tires that will not leave marks.
2. Ensure slab surface is protected from equipment scrapes, impact abrasions, etc. Repair damaged surface or remove slab panel as directed by Owner's Representative.
3. Inform all trades that the slab must be protected at all times.
4. General Contractor is to provide or enforce compulsory slab protection at all times.

## F. Pre-Installation Conference:

1. Conduct conference at project site to comply with requirements in Division 1 Section "Project Meetings"

## G. Gloss Requirements:

1. General:
  - a. Gloss shall be considered as a quantitative value that expresses the degree of reflection when light hits the concrete floor surface.
  - b. Gloss measurements to be taken independent of ambient lighting and to be taken within a sealed measurement window located beneath the test unit. The measurements are to be made using a Horiba IG-320 Gloss Checker.
  - c. Perform sweeping, scrubbing and high speed burnishing to achieve and maintain gloss requirements until Owner Possession.
2. Gloss Measurement Requirements: Ensure the Specified Overall Gloss Value (SOGV)  $\geq 40$  and Minimum Local Gloss Value (MLGV)  $\geq 25$  as determined by Specification 01411.
3. Contractor to pay for additional gloss testing not identified in Specification 01411.
4. Remedies for Out-of-Tolerance Work: Remedy floor area as required by Owner Representative.

## 1.04 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in original containers, with seal's unbroken, bearing manufacturer labels indicating brand name and directions for storage.
- B. Dispense special concrete finish materials from factory numbered and sealed containers. Maintain record of container numbers.
- C. Submit record of container numbers to liquid surface treatment manufacturer for validation and issuance of warrantee at the conclusion of the applications.

## 1.05 PROJECT CONDITIONS

- A. The General Contractor is to accommodate the needs of the liquid surface treatment installer and keep the immediate work areas clear of other trades, pedestrian traffic and disturbances.
- B. The General Contractor must coordinate the work so as not to delay other work in progress.
- C. Environmental limitations:
  1. Comply with manufacturers written instructions for substrate temperature and moisture content, ambient temperature and humidity, ventilation, and other conditions affecting liquid surface treatment performance.
  2. Limit and control damage from excessive dust caused by sweeping or high speed burnishing.
  3. Limit and control damage from moisture. Remove standing moisture from floor after application of liquid surface treatment.
  4. Dispose of used or diluted liquid surface treatment chemicals and wash water according to applicable Governmental standards.
- D. Close areas to traffic during floor application and after application, for time period recommended in writing by manufacturer.

## PART 2 - PRODUCTS

## 2.01 MATERIALS AND MANUFACTURERS

- A. Provide products for scrubbing and burnishing as manufactured by the following or equivalent to the extent as required to produce specified results.
  1. 3M Corporation: Scotch-Brite Diamond Floor Pad Plus System
  2. Concrete Polishing Solutions: SpinFlex Diamond Cleaning and Maintenance Pads
  3. Diamatic: Flor-Grit Micro Polishing Pads
  4. ETC: Gorilla Natural Fiber Pads or Diamond by Gorilla
  5. Glit/Microtron: Janitorial Pads
  6. HTC, Inc: Twister DCS Polishing Process
  7. Norton: Cleaning and Maintenance Pads
  8. Vortex: Diamond Maintenance Pads

**Construction Specification****SPECIAL CONCRETE FLOOR FINISHES**

- B. Pads: Pads, in descending order of abrasiveness, may include the following or similar as required to produce specified results. Pads that scratch or strip the surface paste or mortar fraction are not permitted.
  - 1. Blue Cleaning Pad
  - 2. Red Cleaning & Polishing Pad
  - 3. White Polishing Pad
  - 4. Beige/UHS Polishing Pad
  - 5. Natural Fiber Polishing Pad
  - 6. Diamond Impregnated Janitorial Pads
- C. Rigid or Flexible Backer Plates with Resin or Metal Bond Diamonds
  - 1. Use of ride-on or walk-behind equipment with rigid or flexible backer plates equipped with resin or metal bond diamonds is prohibited.
- D. Scrubbing and Burnishing Machines: Equipment used for scrubbing and burnishing operations shall be Clark, Advance, Tennant, PowerBuff, Tornado or similar equipment as required to produce the specified results.
- E. Liquid Floor Cleaner: As manufactured by, or recommended by, Liquid Surface Treatment Manufacturer.
- F. Liquid Surface Treatment
  - 1. Lithium or potassium silicate. Fluorosilicate not allowed.
  - 2. Manufacturers:
    - a. Convergent: Pentra-Sil NL
    - b. Diametric: Flor-Sil
    - c. Euclid: UltraSil-Li+
    - d. L.M. Scofield Company: Formula One Lithium Densifier MP
    - e. L&M Construction Chemicals: LiON Hard
    - f. Nox-Crete: Duro-Nox LS
    - g. Prosoco: Consolideck LS
    - h. SealSource: SS Harden X
  - 3. The use of products containing acrylics or other membrane forming compounds used to enhance gloss is strictly prohibited.

**2.02 RELATED MATERIALS**

- A. Water:
  - 1. Potable

**PART 3 -EXECUTION****3.01 GENERAL REQUIREMENTS AND SURFACE CONDITIONS:**

- A. Ensure floor is thoroughly cleaned concurrent with wet curing sheet removal to remove all residue, alkalis, etc. Do not permit the floor surface to dry between wet curing sheet removal and initial scrubbing.
- B. Examine slab surface prior to starting work, with liquid surface treatment Applicator present, for conditions affecting the Applicator's ability to properly apply the liquid surface treatment. Correct conditions detrimental to timely and proper work. Do not proceed until unsatisfactory conditions are corrected.
- C. Verify via water test or other non-destructive test that no bond breakers, curing compounds or similar materials are present. If such materials are present; do not proceed until they are removed.
- D. Prior to application, verify that floor surfaces are free of laitance.
- E. Coordinate with joint filling operations. Do not perform wet cleaning within 72 hrs prior to joint filling.
- F. Do not use stain or scuff removing agents such as "crete-strip".
- G. Utilize riding machines to the maximum extent practical to achieve optimum efficiency.

**3.02 APPLICATION**

- A. Start initial liquid surface treatments in presence of approved manufacturer's technical representative.
- B. Immediately after curing is complete in a given area, sequentially remove curing sheets and thoroughly clean and dry slab top surface. During curing sheet removal, do not permit slab surface to dry prior to cleaning. Double-scrub floor and overlap

**Construction Specification****SPECIAL CONCRETE FLOOR FINISHES**

passes with automatic scrubber, appropriate soft brushes or pads and specified floor cleaner to remove all latent salts and other residue.

C. Examination and Preparation:

1. Immediately prior to starting work, verify that surfaces conform to product manufacturer's requirements for substrate conditions.
2. Vacuum and clean saw cut joints and surrounding area so that no dust remains to react with liquid surface treatment material.
3. Prior to application, verify floor is free of latent salts, curing membrane, bond-breaker, laitance and any other residues that are detrimental to achieving surface appearance requirements. Do not proceed until unsatisfactory conditions have been corrected.
4. Beginning of liquid surface treatment application indicates acceptance of existing conditions.

D. Initial Application: Schedule to begin after 24 hours of drying after completion of curing sheet removal and initial cleaning.

1. Apply to all interior troweled and broomed surfaces. Apply prior to the application of bond breaker for tilt wall buildings.
2. Employ methods to ensure concrete surface is not damaged during application, including discoloration.
3. Apply liquid surface treatment in accordance with manufacturer's published instructions and approved submittal.

E. Final Application: Schedule to begin 10 days prior to rack installation on all troweled areas.

1. Cleaning and Floor Preparation:

- a. Power sweep floor area and blow out corners and adjacent columns. Use sweeping compound to control airborne dust.
  - b. Remove remaining saw cut residue.
  - c. If oil spots, rust stains, paint droppings, tire marks and other surface stains are present in spite of specified precautions, remove and replace affected slab panels unless Owner's Representative accepts treated and cleaned areas. If allowed, treat oil spots with oil emulsifier, and oil absorber materials or other acceptable means and materials. If allowed, remove paint droppings with soft, damp cloth and solvent stripper. Do not use stripper with an acidic pH.
  - d. Double scrub floor with automatic scrubber with appropriate soft brushes or pads and specified floor cleaner to remove all latent salts and other residue.
  - e. Power rinse surface removing traces of any remaining residue.
2. Liquid Surface Treatment Application:
- a. Immediately following cleaning operation and surface is dry, use low pressure sprayer, airless sprayer or other approved mechanism to apply liquid surface treatment material at manufacturers recommended coverage rate. Evenly distribute and back-wipe liquid surface treatment material using micro-fine pad to remove puddles and even lap marks.

F. Scrubbing and Burnishing of Concrete Surface: Scrub and burnish floor surface by such means as necessary to achieve the specified gloss.

1. Verify that floor surface is dry prior to burnishing procedure.
2. Achieve specified properties of the surface without changing the natural appearance of the concrete, except for the gloss.
3. Methods such as extra scrubbing and high speed burnishing using soft, flexible polishing pads shall be considered to produce specified gloss requirements.
4. Suitable methods may also include multiple and perpendicular passes of polishing with high speed scrubbing machines using graduated polishing and scrubbing pads.
5. Start burnishing with least aggressive pads, such as beige/UHS or natural pads, and only step up to next most aggressive pads as necessary to achieve specified results.
6. Continue scrubbing or burnishing procedure until the specified gloss is attained.
7. ITC to test for gloss just prior to Rack Installation as noted in Specification Section 01411.
8. General Contractor is required to perform additional sweeping, scrubbing or high speed burnishing to all exposed slabs after final application of chemical treatment, after rack installation prior to turnover and during the week of grand opening.

### 3.03 WORKMANSHIP AND CLEANING

- A. The premises shall be kept clean and free of debris at all times.
- B. Remove spatter from adjoining surfaces, as necessary.
- C. Repair damages to surface caused by cleaning operations as directed by the Owner's representative.
- D. Remove debris from jobsite

**Construction Specification**

**SPECIAL CONCRETE FLOOR FINISHES**

1. Dispose of materials in separate, closed containers in accordance with local regulations and per the Storm Water Protection Procedures Plan (SWPPP)

3.04 PROTECTION

- A. Protect finished work until fully cured in accordance with manufacturer's recommendations.

END OF SECTION

**PART 1 - GENERAL****1.01 SCOPE OF WORK**

- A. Include all labor, materials and appliances, and perform all operations in connection with the installation slabs on ground, and all related work incidental to the completion thereof, as shown on the structural drawings and as specified herein.

Work includes:

1. Subgrade preparation
2. Formwork, reinforcing, inserts, sleeves, accessories, miscellaneous embedded items
3. Cast-in-place concrete

- B. Related work specified elsewhere includes but may not be limited to:

1. Section 01411 - Testing and Inspection
2. Section 02520 - Portland Cement Concrete Paving (As noted on the Civil Drawings)
3. Section 03150 - Slab on Ground Accessories
4. Section 03300 - Cast-In-Place Concrete
5. Section 03360 - Special Concrete Floor Finishes
6. Section 07901 - Joint Sealers/Fillers

**1.02 RELATED DOCUMENTS**

- A. Unless otherwise shown or specified, the work shall conform to the following standards of the American Association of State Highway and Transportation Officials (AASHTO):

1. AASHTO T318: Standard Test For Water Content of Freshly Mixed Concrete Using Microwave Oven Drying

- B. Unless otherwise shown or specified, the work shall conform to the following standards and recommendations of the American Concrete Institute (ACI):

1. ACI 117: Standard Tolerances for Concrete Construction and Materials
2. ACI 211.1: Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete
3. ACI 301: Specifications for Structural Concrete
4. ACI 305R: Hot Weather Concreting
5. ACI 305.1: Specification for Hot Weather Concreting
6. ACI 306.1: Standard Specification for Cold Weather Concreting
7. ACI 308.1: Standard Specification for Curing Concrete
8. ACI 318: Building Code Requirements for Structural Concrete
9. ACI 350: Environmental Engineering Concrete Structures
10. ACI SP-66: ACI Detailing Manual

- C. Unless otherwise shown or specified, the work shall conform to the following standards of the American Society for Testing and Materials (ASTM):

1. ASTM A 615: Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
2. ASTM A 706: Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement
3. ASTM C 31: Making and Curing Concrete Test Specimens in the Field.
4. ASTM C 33: Concrete Aggregates.
5. ASTM C 39: Concrete Specimens, Compressive Strength of.
6. ASTM C 94: Ready-Mixed Concrete.
7. ASTM C 136: Sieve Analysis of Fine and Coarse Aggregates.
8. ASTM C 150: Portland Cement.
9. ASTM C 171: Sheet Materials for Curing Concrete.
10. ASTM C 260: Air-Entraining Admixtures for Concrete.
11. ASTM C 494: Chemical Admixtures for Concrete.
12. ASTM C 702: Reducing Field Samples of Aggregate to Testing Size.
13. ASTM C 1315: Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
14. ASTM D 75: Sampling Aggregates.
15. ASTM D 448: Aggregate for Road and Bridge Construction.
16. ASTM D 698: Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>))
17. ASTM D 1557: Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft<sup>3</sup> (2,700 kN-m/m<sup>3</sup>))
18. ASTM D 1751: Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).
19. ASTM D1752: Standard Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction
20. ASTM D3575: Standard Test Methods for Flexible Cellular Materials Made From Olefin Polymers

21. ASTM E 1155: Standard Test Method for Determining Floor Flatness and Levelness Using the "F Number" System.
- D. Unless otherwise shown or specified, the work shall conform to the following standards of the Concrete Reinforcing Steel Institute (CRSI):
1. CRSI: Manual of Standard Practice.
  2. CRSI: Placing Reinforcing Bars.
- E. Unless otherwise shown or specified, the work shall conform to the following standards of the Federal Specifications (FS): FS TT-S-00230c (2): Sealing Compound; Elastomeric Type, Single Component (for Caulking, Sealing, and Glazing in Buildings and Other Structures).
- F. Unless otherwise shown or specified, the work shall conform to the following standards of the American Plywood Association (APA): APA: Grading Rules.
- G. Unless otherwise shown or specified, the work shall conform to the following standards of the Portland Cement Association (PCA): Design and Control of Concrete Mixtures.
- H. Unless otherwise shown or specified, the work shall conform to the following standards of the National Concrete Ready-Mix Association: NCRMA Inspection Standards.

### 1.03 SUBMITTALS TO ARCHITECT OF RECORD

- A. Concrete Supplier(s) and Certifications: Name and address of each proposed concrete supplier and their National Concrete Ready-Mix Concrete Association Plant Certification Checklist and their State Department of Transportation Approval Letter. Submit 28 days minimum prior to use to the Architect of Record. The Architect of Record will forward a copy to the Owner's ITC (Independent Testing Contractor) for approval. For developer prepared "pad ready" sites, the submittal shall occur as soon as possible after the Owner has given the Contractor a Notification to Proceed. The Contractor shall allow two weeks for the review of the submittal.
- B. Concrete Mix Design: All mix designs shall be proportioned in accordance with ACI 318, Section 5.3 and submitted for review to Structural Services, Inc (SSI) via an email attachment of the smallest file size or fax a minimum of three (3) weeks prior to placing, before any concrete is incorporated in the job; if the submittal is by fax, call SSI to notify them. The Architect of Record shall be copied on the submittal to SSI. For developer prepared "pad ready" sites, the submittal shall be made as early as possible after the Owner has given the Contractor a Notice to Proceed. The Contractor should allow two weeks for the submittal to be reviewed. The mix designs shall be sent via email to:

Jerry Holland, THD@ssiteam.com

**SSI Phone Number: 214-522-6438**  
**SSI Fax Number: 214-522-6796**

Once SSI has reviewed the concrete mix design and coordinated any changes with the Contractor/Supplier, they will forward to the Architect of Record via email for Structural review. The Architect of Record will forward the final approved copy back to the Contractor. The Contractor shall not proceed with the concrete placement until both SSI and the Architect of Record have reviewed the mix. All mix designs shall be submitted on the Concrete Mix Design Submittal Form included at the end of this specification. Mix design submittals that do not use the Concrete Mix Design Submittal Form will not be reviewed. The Architect of Record will provide the Contractor with an electronic copy of the Concrete Mix Design Submittal Form, in Microsoft Word format, at the time of bid distribution. Mix designs shall be specifically applicable to this project only. Do not submit design mixes not applicable to the project. The submittals shall state which areas and items are to be used for each design mix. Include the following for each mix:

1. The Home Depot store location and the store number.
  2. The submittals shall state which areas and items are to be used for each design mix.
  3. Separate sieve analyses reports, conducted within 3 months prior to mix design submittal of percentages passing and retained for fine and coarse aggregates, including fineness modulus. Include following sieve sizes: 2 inch, 1-1/2 inch, 1 inch, 3/4 inch, 1/2 inch, 3/8 inch, No. 4, No. 8, No. 16, No. 30, No. 50, No. 100, and No. 200. Provide sieve analysis of percentage retained for combined coarse and fine aggregates.
  4. Type of fine aggregate, whether natural or manufactured.
  5. Ensure the aggregate supplier reports if aggregate are possibly reactive, based on tests or past service.
  6. Ensure aggregate supplier reports if aggregate can possibly cause pop-outs, "D" cracking, or other disruptions due to moisture gain, freezing, or other mechanisms, based on tests or past service.
- C. Reinforcing Bar Shop Drawings:
1. Complete information for installing reinforcing, including placement plans, bar bending diagrams, splice lengths and locations, bar spacing, concrete cover, support devices, and accessories.
  2. Conform to ACI SP-66, CRSI, and ACI 318.



**Construction Specification****SLAB ON GROUND**

- D. Product Data: Brand name, chemical composition, installation directions, and certificate of compliance with required standards for the following products 21 days minimum prior to use. For developer prepared "pad ready" sites, the submittal shall occur as soon as possible after the Owner has given the Contractor a Notification to Proceed. The Contractor shall allow two weeks for the review of the submittal.
1. Air-entraining admixture.
  2. Low-range water-reducing admixture.
  3. Mid-range water-reducing admixture.
  4. Retarding admixture.
  5. Accelerating admixture.
  6. Sheet materials for curing concrete.
  7. Liquid membrane curing and sealing compound (limited use).
- E. Joint Types and Locations:
1. Proposed joint types and locations for joints not shown on Drawings.
  2. Submit 21 days minimum prior to placing concrete in area concerned.
- F. Hot Weather Concreting Procedures:
1. Submit procedures and changes proposed to facilitate hot weather concreting.
  2. Submit 21 days prior to implementation. For developer prepared "pad ready" sites, the submittal shall occur as soon as possible after the Owner has given the Contractor a Notification to Proceed. The Contractor shall allow two weeks for the review of the submittal.
- G. Cold Weather Concreting Procedures:
1. Submit procedures and changes, per ACI 306.1 and otherwise, proposed to facilitate cold weather concreting.
  2. Submit 21 days prior to implementation. For developer prepared "pad ready" sites, the submittal shall occur as soon as possible after the Owner has given the Contractor a Notification to Proceed. The Contractor shall allow two weeks for the review of the submittal.
- H. Alternative Cold Weather Concreting Procedures
1. In addition to the Architect of Record approval, the use of these procedures requires the approval in writing of the Home Depot's Project Manager. This approval will depend on the expected weather conditions at the time of slab placement.
  2. Submit the following items 14 days prior to slab placement:
    - a. Procedures and changes, per ACI 306.1 and otherwise, proposed to facilitate cold weather concreting.
    - b. Proposed alternative curing along with the manufacturers' product data sheets, installation procedures, application rate and removal procedures.
    - c. Provide letter of certification from chemical manufacturer that states the applicator of the proposed alternative cure is a certified applicator of the product in good standing and is familiar with the proper manufacturer's procedures and installation requirements.
    - d. Provide a letter from the applicator performing the work per specification 03360 that the proposed alternative curing material is compatible with the materials and procedures used to chemically densify the slab.

**1.04 SUBMITTALS TO OWNERS ITC**

- A. Delivery Tickets:
1. Copies of delivery tickets for each load of concrete delivered to site.
  2. Indicate on each ticket all information required by ASTM C 94. Including the quantity of water that can be added at the site without exceeding the maximum water-cement ratio specified.
  3. Mix identification number on ticket to match number on submitted and approved mix design noted above.
  4. Submit copies to the Owner's ITC on same day as concrete delivery.
  5. Indicate number of drum revolutions from when water is added until concrete is discharged.
- B. Coarse Aggregate Base:
1. Sieve analysis of coarse aggregate base.
  2. Submit to the Owner's ITC.
  3. Submit 14 days minimum prior to use. For developer prepared "pad ready" sites, the submittal shall occur as soon as possible after the Owner has given the Contractor a Notification to Proceed. The Contractor shall allow two weeks for the review of the submittal.
- C. Fine Aggregate Base:
1. Sieve analysis of fine aggregate base.

2. Submit to the Owner's ITC.
  3. Submit 14 days minimum prior to use. For developer prepared "pad ready" sites, the submittal shall occur as soon as possible after the Owner has given the Contractor a Notification to Proceed. The Contractor shall allow two weeks for the review of the submittal.
- D. Pump Hoses:
1. Method of operating pump hoses so as to prevent displacement of reinforcing steel, dowels, forms, and aggregate base.
  2. Pump hose sizes.
  3. Submit to the Owner's ITC. ITC to verify that pump hose size is adequate for larger course aggregate sizes.
  4. Submit 14 days minimum prior to first operation. For developer prepared "pad ready" sites, the submittal shall occur as soon as possible after the Owner has given the Contractor a Notification to Proceed. The Contractor shall allow two weeks for the review of the submittal.

#### 1.05 QUALITY ASSURANCE

- A. It shall be the responsibility of the Contractor to produce concrete slabs of the strength, durability, workability and specified finish.
- B. The Owner will employ and pay for the services of an Independent Testing Contractor (ITC) to provide testing and inspections of the concrete work.
- C. The services of the ITC, and the information provided by the ITC, are provided for the sole benefit of Owner. The information is provided to Contractor only so the Contractor is aware of what is being reported to Owner. The Contractor shall not, and is not entitled to, rely upon any information provided by the ITC in any manner. Contractor is solely responsible for assuring that the Work complies with the Contract Documents in all respects and may not rely on the ITC for this, or any other, assurance. The ITC and its representatives are not authorized to revoke, alter, relax, enlarge or release any requirements of the Contract Documents, approve or accept any portion of the Work, perform or excuse any duties of Contractor, or be a party to the scheduling of the Work. The ITC is not an authorized agent of the Owner with respect to the relationship between Owner and Contractor.
- D. Concrete materials and operations shall be tested and inspected as the work progresses. Failure by the ITC to detect any defective work or material shall not in any way prevent later rejection (when such defect is discovered) nor shall it obligate the Owner for final acceptance.
- E. See Section 01411 Testing and Inspection for a complete description of the services to be performed by the ITC and additional Contractor responsibilities to facilitate that work.
- F. Allowable Tolerances:
  1. Formwork: Conform to most stringent requirements of ACI 117 and ACI 301, except as specified herein.
  2. Slab on ground shall conform to ACI 117, unless noted otherwise.
  3. Slab on Ground Base Fine Grade: +0 inch, -3/4 inch, with transition no greater than 3/4 inch vertically to 8 inches horizontally for level slab.
  4. Average slab on ground thickness tolerance: -0 inch
  5. Minimum slab on ground thickness tolerance: -3/4 inch
  6. Ensure at least 85% of the slab on ground area will have a thickness that exceeds the thickness shown on the drawings minus 1/2 inch. Thickness samples are to be randomly located from each slab placement and not exceed 1000 square feet of slab surface area.
  7. Floor Finished Surface Flatness and Levelness:
    - a. All slabs shall conform to the following tolerances as measured in accordance with ASTM E 1155.

Area	Overall		Local	
	F <sub>F</sub>	F <sub>L</sub>	F <sub>F</sub>	F <sub>L</sub>
Interior	50	35	35	24

- i. Bound individual floor sections for testing purposes by the following that provide the smallest sections: construction joints, contraction joints, or column and half-column lines.
- ii. Additional Requirements:
  - a) Conform to F-numbers specified for floor areas within 2 feet of construction and isolation joints, in lieu of ASTM E 1155 requirements excluding these areas.
  - b) Limit to 1/4-inch maximum elevation change that may occur within 2 feet of vertical elements (such as columns or walls) that pass through slab surface.
- b. Remedies for Out-of-Tolerance Work:
  - i. Remove and replace slabs-on-ground measuring below either (or both) of specified minimum local F-numbers, unless approved by Owner. If allowed to stay in place, remedy out-of-tolerance work as required by Owner.

**Construction Specification****SLAB ON GROUND**

- ii. If entire project floor, when completed, fails to meet or exceed either (or both) of specified overall F-numbers, then remedy entire floor as required by Owner..
    - c. Elevation Envelope: Provide top of entire slab-on-ground within  $\pm 3/4$  of an inch of finished floor elevation shown on Drawings.
    - d. Cost Responsibility: Costs for corrective work and extra testing required by defective work borne by Contractor.
  - 8. Anchor Bolt and Other Embedment Placements:
    - a. 1/8 inch center to center of any 2 anchor bolts or other embedments within group.
    - b. 1/4 inch center to center of adjacent groups.
    - c. 1/4 inch within specified elevation.
  - 9. Slab on Ground Dowels:
    - a. 0.075 inch maximum in dowel straightness.
    - b. Plus or minus 1/8 inch in dowel alignment in vertical and horizontal planes.
  - G. Workmanship:
    - 1. If results of strength tests reveal deficiencies in concrete, meet requirements of ACI 318 and ACI 301.
  - H. Test placements:
    - 1. Unless otherwise allowed, prior to installation of slabs, make a minimum of 1 to 2 test placements as directed by the Owner's Representative. Test placements are to be in an area designated by the Owner's Representative.
    - 2. Test placement shall be a minimum size of 12 ft x 20 ft x 6 in thick, placed on the same substrate indicated for the interior building slab in the construction documents.
    - 3. Test placements will be temporary, unless it meets all of the specified criteria for its location and allowed by the Owner's Representative.
    - 4. Determine if slab concrete mix is adequate to meet specified requirements.
  - I. Notification of Owner's ITC for Observation of Installed Formwork and Reinforcement: Notify Owner's ITC 3 working days minimum prior to placing concrete to allow time for observation of installed formwork and reinforcing.
- 1.06 PRODUCT DELIVERY, STORAGE, AND HANDLING**
- A. Deliver packaged items in manufacturer's container with seals intact.
  - B. Mark reinforcing, accessories, and embedded items for proper identification and placement location.
  - C. Store materials, except aggregate, off ground and protect from moisture and contamination.
  - D. Stockpile aggregate in manner to prevent contamination with other materials or with other sizes of aggregates. Conduct tests for determining conformance to requirements at point of batching. Do not use bottom 6 inches of aggregate piles in contact with ground. Allow sand to drain until it has reached uniform moisture content before it is used.
  - E. Store admixtures in manner to prevent contamination. Protect admixtures from extreme temperatures that would adversely affect their characteristics.
- 1.07 ENVIRONMENTAL CONDITIONS**
- A. Concreting in Hot, Dry and/or Windy Weather:
    - 1. Employ methods to avoid cracking when the concrete rate of evaporation exceeds 0.2 pounds per square foot per hour or when any combination of concrete materials and weather conditions are favorable for the formation of plastic shrinkage cracks.
    - 2. Maintain an accurate thermometer at the job site to check temperature of concrete
    - 3. Unless otherwise allowed, reject concrete if its temperature before placement is over 90°F.
    - 4. Unless otherwise allowed, during hot weather mixing and delivery (discharge) time to be shorter than specified in ASTM C 94 as follows:
      - a. When air temperature is between 85°F and 90°F, reduce allowable mixing and delivery time from 90 minutes to 75 minutes.
      - b. When air temperature is over 90°F, reduce allowable mixing and delivery time to 60 minutes.
    - 5. Do not place concrete when forms, subgrade, base, or reinforcing bars are more than 120°F or more than 10°F hotter than ambient air temperature.
    - 6. Cool with water or water-soaked burlap as necessary, but allow no standing water on surface on which concrete is placed.
  - B. Concreting in Cold Weather:

**Construction Specification****SLAB ON GROUND**

1. Conform to ACI 306.1 when temperature and other environmental conditions are as noted therein and following additional requirements:
    - a. Frost susceptible soil shall be replaced with non-frost susceptible soil below the slabs to the depth determined by the Geotechnical Engineer.
    - b. Frozen base and subgrade soils shall be thawed immediately before placing concrete.
  2. Do not place slabs on subgrade, or base that are more than 20°F cooler than concrete. Warm subgrade, or base to decrease temperature differential to 20°F or less.
- C. Precipitation Protection: Protect surfaces of exposed concrete from precipitation until adequate strength is gained to prevent damage.

**1.08 PROTECTION OF WORK**

- A. Wheeled construction equipment is prohibited from any slab on ground until the completion of curing period.
- B. Wheeled construction equipment used on any slab shall have tires that will not leave skid marks.
- C. Wheeled Equipment shall be diapered to prevent oil or other fluid leaks from staining the slab. Additionally, drop cloths shall be placed below any equipment that is parked on the slab on ground.

**PART 2 - PRODUCTS****2.01 MATERIALS**

- A. Cement:
  1. The cement type shall be as indicated on the Structural Drawings.
  2. Unless otherwise allowed, use only 1 brand throughout project.
- B. Aggregates:
  1. ASTM C 33, with following requirements:
    - a. Consider concrete not covered by building materials or soil to be subject to abrasion and in severe weathering region.
    - b. Unless otherwise allowed, allow no coal or lignite in concrete that will not be covered by building materials or soil.
  2. Do not use manufactured sand for slabs unless blended with natural sand or otherwise allowed.
  3. Conform to following, unless otherwise allowed:
    - a. Of total combined coarse and fine aggregates per mix design, do not allow material retained on any 1 sieve to be less than 6% nor more than 24% of total by weight, except:
      - i. Largest coarse aggregate size to be #4 stone, unless otherwise noted. Retain 1% to 8% of total combined aggregates per mix design on largest sieve with retained aggregate.
      - ii. Maintain 6% to 15% of total combined aggregates per mix design retained on each of Nos. 30 and 50 sieves.
      - iii. Maintain 3% to 7% of total combined aggregates per mix design passing the No. 50 sieve.
    - b. Gradation requirement of ASTM C 33 may be waived in order to meet ranges specified.
- C. Water: Potable.
- D. Admixtures:
  1. General:
    - a. No admixture to contain more than 0.05% chloride ions. Submit certificate of compliance to this requirement.
  2. Types:
    - a. Air-entraining: ASTM C 260.
    - b. Water-reducing: ASTM C 494, Type A.
    - c. Retarding: ASTM C 494, Type B or D.
    - d. Accelerating: ASTM C 494, Type C or E. Non-chloride.
- E. Fly Ash or Slag: Not permitted, unless Type V cement is unavailable, or is insufficient to mitigate by itself, when it is required to resist severe sulfate exposure or unless it is needed as a means of mitigation against potential aggregate reactivity. See Section 03300 for additional information.
- F. Reinforcing Bars:
  1. ASTM A 615, deformed, Grade 60.
  2. ASTM A 706, deformed, Grade 60.

**Construction Specification**

G. Reinforcing Support Devices:

1. CRSI's "Manual of Standard Practice".
2. Over fine or coarse aggregate base, use precast concrete chairs (blocks) with properly embedded tie wires or other type of supports acceptable to Owner's Representative to prevent penetration of substrate. Plastic chairs shall not be used.
3. Do not use wood, brick, and other such devices that can expand due to moisture gain.
4. Precast concrete chairs (blocks) to have minimum compressive strength of 4000 psi.

H. Aggregate Base Materials:

1. General
  - a. Aggregate base materials must meet the minimum requirements of the State Department of Transportation.
  - b. Base materials shall have negligible sulfate content with less than 0.1% soluble concentration by weight or less than 150 ppm in water.
2. Course Aggregate Base
  - a. Unless not available or otherwise recommended by Owner's Geotechnical Engineer, use crusher run road base with rock fines. Otherwise follow Owner's Geotechnical Engineer's recommendations.
3. Fine Aggregate Base:
  - a. Clean granular fill with less than 3% clay and/or friable particles.
  - b. Provide gradation per ASTM D 448 No. 10 with 6% to 12% passing No. 200 sieve or following table:

<u>Std. Sieve Size</u>	<u>% Passing</u>
	100
No. 4	85-100
No. 8	75-95
No. 16	55-75
No. 50	25-45
No. 100	10-30
No. 200	6-12

I. Formwork:

1. Plywood for Concrete Surfaces Not to be Exposed After Construction is Complete:
  - a. APA B-B Plyform exterior grade or better, Class I, with straight, sealed edges and 5/8 inch minimum thickness.
  - b. HDO Plyform is acceptable.
2. Plywood for Concrete Surfaces to be Exposed After Construction is Complete:
  - a. APA HDO Plyform, exterior grade or better, Class I, with straight, sealed edges and 5/8 inch minimum thickness.
3. Lumber: Dressed, tongue and grooved, free from loose knots.
4. Metal: Smooth, clean, corrosion-free, without dents or holes, with closely matching edges.
5. Fiberglass: Smooth, clean, without dents or holes, with closely matching edges.
6. Partial depth forms made from wood, steel or foam are not permitted.

J. Form Release Agents:

1. Type acceptable to cement manufacturer, will not cause surface imperfections, non-staining, and compatible with field applied paints, curing compounds, and other coatings.
2. Use same brand form release agent for all forms.

K. Form Accessories:

1. Form ties, anchors and hangers of sufficient strength to completely resist displacement of forms due to construction loads and depositing of concrete.
2. Provide ties and spreader form ties designed so no metal will be within 1 inch of surface when forms are removed.
3. Where concrete surfaces are exposed to view, use form ties that will leave a depression not more than 1 inch in diameter when removed.
4. Provide form sealants and gaskets as necessary to provide tight forms.

L. Evaporation Retardant:

1. Water-based polymer, sprayable.
2. A minimum of 5 gallons is to be on site at the time of concrete placement.
3. Acceptable Products and Manufacturers:
  - a. Dayton Superior: Aquafil J74RTU
  - b. Euclid Chemical Company: "Euco-bar"
  - c. Master Builders Solutions (BASF): "Confilm" MasterKure ER 50
  - d. SpecChem: SpecFilm RTU Finishing Aid Surface Retarder

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**Construction Specification**

- M. Screed Chairs: Metal; wood not permitted.
- N. Firm Preformed Joint Filler: See Section 07901 – Joint Sealers/Fillers
- O. Soft Preformed Joint Filler: See Section 07901 – Joint Sealers/Fillers
- P. Elastomeric Joint Materials: See Section 07901 – Joint Sealers/Fillers
- Q. Semi-Rigid Joint Filler: See Section 07901 – Joint Sealers/Fillers
- R. Sheet Materials for Moist Curing Concrete Slabs: ASTM C 171.
  - 1. Synthetic Fiber/Plastic Sheet, Single use sheets:
    - a. White synthetic fiber matting securely attached to white plastic sheet backing.
    - b. Ensure sheets are new and have never been used before.
    - c. Acceptable Product and Manufacturer:
      - i. PNA Construction Technologies: "HydraCure - S16"
- S. Slab Liquid Membrane Curing and Sealing Compound
  - 1. Conform to ASTM C 1315, Type I.
  - 2. 25% minimum solids content.
  - 3. Acceptable Products and Manufacturers:
    - a. Dayton Superior: Cure & Seal LV 25% J20 UV
    - b. Euclid Chemical Company: Super Rez-Seal
    - c. Sonneborn (BASF): Kure-N-Seal 30
  - 4. Acceptable VOC compliant Products and Manufacturers (use only where local VOC restrictions prohibit the products listed above, confirm compliance with local authorities):
    - a. Dayton Superior: Cure & Seal 1315 EF
    - b. Euclid Chemical Company: Super Aqua-Cure VOX
- T. Alternative Cold Weather Curing Material for Concrete Slabs:
  - 1. Removable curing compound including procedures and chemical required for removal.
- U. Interior Slab Hardened and Polished Liquid Surface Treatment (See Section 03360 – Special Concrete Floor Finishes)
- V. Exterior Slab Liquid Surface Treatment
  - 1. Conform to ASTM C 309, Type I, Class A & B.
  - 2. Acceptable Products and Manufacturers:
    - a. Euclid Chemical Company: Diamond Clear 350
- W. Abrasive Aggregate: Aluminum oxide or other approved material, factory-graded, packaged, rust-proof, non-glazing and not affected by moisture.
- X. Slab on Ground Joint Reinforcing: See Section 03150 – (FBO) Slab on Ground Accessories
- Y. Vapor Retarder (when required):
  - 1. Provide a flexible, preformed sheet membrane having a water-vapor permeance rate no greater than 0.03 perms when tested in accordance with ASTM E154, Section 7, resistant to decay when tested by ASTM E154, Section 13 with minimum permeance of 0.06 perms and meeting or exceeding all other requirements of ASTM E1745 Class A.
    - a. Provide 15 mil minimum membrane when concrete is to be placed by truck or buggy.
      - i. Acceptable products and manufacturers
        - a) Stego Industries, LLC: "Stego Wrap 15 mil Class A"
        - b) Reef Industries: "Griffolyn 15 mil Green"
        - c) Raven Industries: "Vapor Block 15 mil"
    - Or
    - b. Provide 10 mil minimum membrane when concrete is to be placed by pump or conveyor.
      - i. Acceptable products and manufacturers
        - a) Stego Industries, LLC: "Stego Wrap 10 mil Class A"
        - b) Reef Industries: "Griffolyn 10 mil Green"
        - c) Raven Industries: "Vapor Block 10 mil"

**Construction Specification**

**2.02 PROPORTIONS**

A. General:

1. Use only materials and their proportions included on Concrete Mix Design Submittal Forms approved for this Project.
2. Measure and mix ingredients in accordance with most stringent requirements of ACI 211.1, ACI 301, and ASTM C 94.

B. Strength: Specified on Drawings.

C. Workability: Must have proper consistency to be worked readily into forms and around reinforcement without segregation, voids or, excessive bleeding.

D. Minimum Cementitious Materials Content for all slabs on ground:

**MINIMUM CEMENTITIOUS MATERIALS CONTENT FOR FLOORS**

Nominal Maximum Size Aggregate (in.)	Cementitious Materials Content (lb/yd <sup>3</sup> )
1 1/2	470
1	520
3/4	540
1/2	590
3/8	610

E. Water/Cement Ratio:

1. Interior building slab, maximum w/cm = 0.55
2. Exterior slabs subject to freezing and thawing and/or deicing chemicals, maximum w/cm = 0.45
3. All other exterior slabs, maximum w/cm = 0.50.

F. Air-Entraining Admixture:

1. In cold weather climates, where the coldest average daily low temperature is 32° F or below, concrete exposed to weather in service shall be air-entrained. Air content shall be as indicated in the table below.

**Total Air Content for Frost Resistant Concrete**

Nominal Maximum Aggregate Size (in)	Air Content* %
3/8	7.5
1/2	7
3/4	6
1	6
1 1/2	5.5
2	5
3	4.5

\* The tolerance on air content as delivered shall be  $\pm 1.5$  percent.

2. Do not air-entrain interior floor slabs with troweled finish. The maximum air content of trowel finished interior slabs shall be 3%.

G. Slump:

1. Unless otherwise allowed, proportion concrete so slump without adding water-reducing admixtures would be a maximum of 4"  $\pm$  1" tolerance. The slump of the concrete prior to the addition of water-reducing admixture shall be between 2" and 3". The slump of the concrete containing water-reducing admixture shall not exceed 8". The slump of the concrete shall be determined prior to the addition of the water-reducer and at the point of discharge.

H. Admixtures:

1. Water-reducing admixture may be added to improve workability and reduce water content.
2. Mid-range water-reducing admixture may be added to improve workability or pumpability.
3. Provide an air-entraining admixture only where air-entrainment is specified.
4. Other admixtures may be used only with written approval of Owner's Representative.
5. Do not use calcium chloride as an additive or in admixtures.
6. Use admixtures in accordance with manufacturer's recommendations.

**2.03 MIXING****A. Ready-Mixed Concrete:**

1. Mix and transport in accordance with ASTM C 94 and ACI 301, except as specified.
2. Reset drum revolution counter to zero on ready-mix concrete truck when water is added to drum.

**B. Site-Mixed Concrete:**

1. Conform to ACI 301.
2. Use central-mix type batch plant, unless otherwise allowed.

**2.04 FABRICATION****A. Reinforcing:**

1. Fabricate reinforcing in accordance with ACI SP-66. Do not heat reinforcing bars for bending purposes, unless otherwise allowed by Owner's Representative.
2. Tie reinforcing bars in bundles and tag with non-rusting tags showing Shop Drawing numbers.
3. When welding of reinforcement is specified or permitted, comply with AWS D1.4. Do not tack-weld crossing bars for assembly of reinforcement, supports or embedded items, unless otherwise allowed.

**PART 3 - EXECUTION****3.01 GENERAL**

- A. Design, construct, erect, support, and remove formwork and related items in accordance with most stringent requirements of ACI 117, 301, and 318.
- B. Place reinforcing in accordance with most stringent requirements of ACI 117, 301 and 318 and CRSI Manual of Standard Practice and Placing Reinforcing Bars.
- C. Unless otherwise specified, place concrete in accordance with ACI 301. If proportioning design mix on basis of laboratory trial batches, do not place concrete until Owner's ITC has reviewed results of design mix 7-day test breaks and permission is given to proceed.
- D. Ensure that all work is properly coordinated:
  1. Structural Drawings and Specifications with those of other disciplines.
  2. Use final corrected Shop Drawings, and placing Drawings.
- E. Provide for concrete supplier to have quality control representative at site for concrete placements for slabs.
- F. Conform to manufacturer's printed instructions for materials and equipment.
- G. During concreting operations, protect adjacent placements from concrete splatter and spillage, scratches, scrapes and any other surface damage that will affect aesthetics.

**3.02 PREPARATORY WORK**

- A. Pre-placement Inspection: Ensure all trades and other participants involved signify that all preparations are in conformance with Contract Documents. Use approved sign-off forms.
- B. Coarse Aggregate Base:
  1. Unless otherwise allowed, install coarse aggregate base where shown on Drawings.
  2. Compact to final thickness shown in layers not exceeding 6 inches, with minimum of 2 passes per layer with vibratory compactor.
  3. Compact fill to 95% of aggregate's Modified Proctor as determined by Method D of ASTM D 1557.
  4. Choke-off top surface with fine aggregate base material (see below).
  5. Provide dry, smooth, flat, dense surface.
- C. Cleaning Equipment: Remove hardened concrete and foreign materials from mixing and conveying equipment.
- D. Formwork:
  1. Unless otherwise noted on Drawings, form vertical surfaces of concrete work.



**Construction Specification****SLAB ON GROUND**

2. Formwork for concrete surfaces to be painted or exposed to view after completion of project to meet following requirements:
    - a. No dents, holes, or patches.
    - b. Individual formwork elements are as large as possible.
    - c. Position individual formwork elements in regular, uniform pattern with all joints aligned.
    - d. Construct forms for removal without hammering or prying against concrete.
  3. Clean all formwork.
  4. Remove rust from steel formwork.
  5. Solidly butt joints and provide backup at joints as required to prevent leakage of cement paste.
  6. Before placing reinforcing steel, thoroughly coat contact surfaces of forms with an approved form release agent, if it is to be used.
  7. Apply form release agent evenly without excess drip.
  8. Do not allow form release agent to come into contact with concrete surfaces against which fresh concrete will be placed, unless noted otherwise.
  9. Moisten wood forms immediately before placing concrete where form release agents are not used.
  10. Just before placing concrete, clean forms and adjacent surfaces again as necessary. Remove wood, sawdust, chips, dirt and other debris.
  11. Provide slab side forms such that by placing a 10-foot straightedge anywhere on side of form hitting 2 points, gap at any point between straightedge and form does not exceed 1/8 inch.
- E. Fine Aggregate Base:
1. Compact to final thickness noted with 2 passes minimum with vibratory compactor to produce smooth, flat, dense surface.
  2. Unless otherwise allowed, fine aggregate to be dry immediately before placing concrete.
  3. Prior to placing concrete, the base shall be proof-rolled with a fully loaded dump truck, or other acceptable means.
  4. The Owner's ITC shall monitor the proof rolling. The properly prepared subgrade will depress a maximum of a 1/2" under a fully loaded dump truck. If the base depresses more than a 1/2", the Contractor shall notify the Owner's Representative for direction on how to proceed.
- F. Vapor Retarder (when required)
1. Place vapor retarder below slab on ground where identified on the drawings.
  2. Follow manufacturer's recommendations and details, unless otherwise noted.
  3. Unroll vapor retarder in a continuous manner to minimize the occurrence of endlaps below the slab.
  4. Overlap sides and ends of adjoining sheets a minimum of 6 inches.
  5. Tape all sheet laps to seal. Clean adhesion area as required prior to taping to ensure proper seal.
  6. All penetrations are to be sealed prior to placing concrete.
  7. Repair all damaged sheets by cutting out damaged area and placing additional sheet material over cutout. The patch shall overlap the cutout area by 6 inches on all sides. Tape overlapping edges of repair area to seal.
- G. Slab Reinforcing:
1. See Section 03150 for Joint Reinforcing
  2. Accurately place and secure reinforcement against displacement by firmly wiring at intersections and splices with not less than No. 18 U.S. Standard Gage annealed wire, or by use of clipping devices permitted by Owner's Representative.
  3. Turn tie wire ends away from concrete exterior.
  4. Ensure reinforcing is clean, free from defects and kinks, loose mill or rust scale or coatings that will reduce bond.
  5. Protect exposed reinforcing bars, inserts and plates intended for bonding with future expansion from corrosion by approved means.
  6. When welding of reinforcement is specified or permitted, comply with AWS D1.4. Do not tack-weld crossing bars for assembly of reinforcement, supports or embedded items, unless otherwise allowed.
- H. Miscellaneous Items:
1. Accurately place and secure against displacement miscellaneous steel, pipe sleeves, inserts, anchors, preformed joint fillers, and miscellaneous embedded items.
  2. Unless noted otherwise on Drawings, ensure corner protection bars and other similar embedded metal items are continuous between concrete joints. If shorter lengths are required for metal items, connect the ends by butt-welding entire joint and grinding smooth exposed surface. Ensure embedded metal items are discontinued at construction, contraction and isolation joints.
  3. Temporarily fill voids in sleeves and inserts with easily removable materials.
  4. Before placing concrete on ground, piping and other utilities under concrete to be inspected and tested and excavations backfilled and properly compacted to solid bearing, as specified.
- I. Joints:
1. Provide construction, isolation and contraction joints as indicated on Drawings and as noted below.

**Construction Specification****SLAB ON GROUND**

2. For bulkheads for construction joints use 1-1/2 inch minimum thick lumber with beveled top; do not use preformed metal bulkheads that will stay in place, unless approved by Owner's Representative.
3. Provide bulkheads full depth of member.
4. Space joints to allow 1 continuous placement between bulkheads.
5. Do not locate longitudinal construction joints in main aisles.
6. Unless otherwise shown or approved by Owner's Representative, maximum spacing between joints to be lesser of following:
  - a. Contraction, construction, or isolation joints in slabs on ground: 15 feet and with length-to-width ratio less than 1.5:1, but preferably less than 1.25:1.

## J. Embedments:

1. Accurately position and securely anchor steel shapes, anchor bolts, casings, conduit, sleeves, and other materials embedded in concrete.
2. Thicken concrete slabs as required to maintain the intended slab thickness at embedded items.
3. Secure embedments to formwork when possible, not only tied or welded to reinforcement.
4. Install clean embedments. After concrete placement, clean embedment exposed surfaces of concrete splatter and other foreign substances.

**3.03 CONVEYING**

- A. General: Handle concrete from mixer to place of final deposit as rapidly as practicable and in manner, which will assure obtaining specified quality of concrete.
- B. Retempering: Discard concrete which has already begun to set; do not retemper with water.
- C. Equipment: Provide mixing and conveying equipment of proper size and design to ensure a continuous flow of concrete to delivery end. Provide conveying equipment subject to Owner's Representative's review. Do not use aluminum pipe or equipment in contact with concrete.
  1. Mixers, agitators and non-agitating units: Conform to ASTM C 94 and current certification requirements of Department of Transportation in state where concrete plant is located.
  2. Belt Conveyors:
    - a. Use only types that will not cause segregation.
    - b. Discharge runs over 30 feet into a hopper.
  3. Chutes: Metal or metal lined installed at slopes not exceeding 1 vertical to 3 horizontal. Ensure chutes with greater slopes or chutes over 20 feet in length discharge into a hopper.
  4. Runways:
    - a. Provide runways or other means above finished concrete level for wheeled conveying equipment.
    - b. Do not support runways on reinforcing.
    - c. Do not wheel equipment directly over reinforcing or metal deck.
  5. Pumps:
    - a. Submit to Owner's Representative for review all changes in concrete mix to necessitate pumping.
    - b. Use pump hoses and other slickline components with 5-inch minimum inside diameter, unless otherwise allowed by Owner's Representative.
    - c. For slickline reducers ensure reduction in diameter is no more than 1 inch over 5-foot length.
    - d. Submit to Owner's Representative method of operating pump hoses so as to prevent displacement of reinforcing steel, dowels, form, and aggregate base.

**3.04 DEPOSITING**

- A. Placing:
  1. The location of all construction and contraction joints shall be as indicated on the Foundation Plan, and no deviations shall be allowed. In no case shall the contractor place more concrete than can be properly and completely finished and saw cut in one day. The size of each placement shall not exceed 28,000 square feet, unless approved by the Owner's representative.
  2. General:
    - a. Do not deposit concrete that has partially hardened or has been contaminated by foreign matter.
    - b. Deposit concrete continuously in layers of such thickness that no concrete will be deposited on concrete which has hardened sufficiently to cause seams or planes of weakness.
    - c. Between construction joints place concrete in a continuous operation such that concrete is plastic at all times and flows readily into spaces between reinforcement
    - d. Do not subject concrete to procedures that will cause segregation.
    - e. Deposit concrete as near as possible to its final position.
  3. Do Not:
    - a. Place concrete over standing water, mud, frost, ice or snow.
    - b. Do not use wet screeds unless permitted by Owner's Representative.

**B. Consolidation:****1. General:**

- a. Consolidate concrete by vibrating, spading or rodding so that concrete is thoroughly worked around reinforcing, and embedded items and into the corners of forms.
- b. Consolidate each layer of concrete with previously placed layers in manner that will eliminate air or stone pockets that may cause honeycombing, pitting or places of weakness.
- c. Do not insert vibrator into portions of concrete that have begun to set unless allowed by Owner's Representative.
- d. Do not use vibrators to transport concrete
- e. Keep spare vibrator on job site during concrete operations.

**2. Formed Elements:** Use internal vibrators, not form vibrators, unless allowed by Owner's Representative.**3. Slabs:**

- a. Consolidate slabs with laser screed, vibrating bridge screed or other means allowed by Owner's Representative.
- b. Use internal vibration along construction joints.
- c. If bar reinforcing is used, use internal vibration around bars.
- d. Do not use grate tampers, jitterbugs or mesh rollers, unless allowed by Owner's Representative.
- e. Move vibrating screed, if used, steadily and as fast as practicable, keeping an adequate surcharge of concrete at forward edge of screed.
- f. Vibrate under all plate dowels. Mark forms before concreting to properly locate dowels after concreting.

**C. Formwork:** After concrete placement, adjust forms and bracing as necessary to maintain proper alignment and eliminate leakage of cement paste.**3.05 FLOOR SLAB FINISHING PROCEDURES****A. General:**

1. Unless otherwise allowed, do not add water to any slab surface during finishing operations.
2. Do not add plain, dry cement to any slab surface during finishing operations.
3. Unless otherwise allowed, perform no finishing operation while water is present on slab surface.
4. If concrete is firm enough for floating but substantial amount of bleed water is still on surface, water may be removed by dragging a rubber hose slowly over surface 1 time, without disturbing or damaging surface.

**B. Initial Leveling:**

1. Complete all bull floating, darbying, and straight edging before any bleed water is present on slab surface.
2. Use highway straightedge 10 feet wide minimum for initial and later leveling instead of bull float where overall floor tolerances specified are greater than  $F_{20}/F_{15}$ .

**C. Hand and Power Floating:**

1. Do not start floating until following conditions are met:
  - a. Bleeding is finished.
  - b. Bleed water is gone, including water sheen on slab surface.
  - c. Concrete will sustain weight of an average man with no more than a 1/8 to 1/4 inch indentation.
  - d. Mortar is not thrown by rotating blades of power float.
2. Do not use following tools for floating:
  - a. Power troweling machine with trowel or finishing blades.
  - b. Fresno or other type of wide metal trowel.
  - c. Power floating machine with water attachment for wetting concrete.
3. Float 3 times minimum, with each floating at right angles to previous floating and final pass at 45 degrees to previous pass.

**D. Troweled Finish**

1. Ensure floor is hand or power floated before starting troweling.
2. Trowel 3 times minimum, with each troweling at right angles to previous troweling.
  - a. For first troweling, keep blade as flat as possible and use low speed, minimizing "washboard" or "chatter marks" and "pitting".
  - b. Trowel two times minimum with first two trowelings at right angles. Some burn marks are acceptable. Refer to test slab. Cease troweling before trowel blades scratch surface.
3. Allow time between trowelings for concrete to stiffen and water sheen to disappear.
4. Final troweling shall continue until the slab has achieved a hard burnished surface with no defects. Differences in the finish of the surface are not acceptable and are critical to the Owner's requirement for a defect free, high sheen final finished surface.
5. Do not ride trowels on existing slabs. Trowels shall be carried off from slab surfaces. When parking power trowels on fresh concrete, place on top of plywood or spray area with evaporation retarder before placing trowel on top of slab.

**E. Broom Finishes**

1. General
  - a. The Contractor shall prepare a sample for each of the broom finishes listed below. The Owner's representative shall approve the samples prior to their use on any concrete placement.
  - b. Broom texture to be in the direction to facilitate drainage.
2. Light Broom Finish
  - a. The surface shall first be given a single float finish as specified above. Immediately after initial floating, it shall be given a light transverse texture by drawing a broom across the surface.
3. Medium Broom Finish
  - a. The surface shall first be given a single float finish as specified above. Immediately after initial floating, it shall be given a medium transverse texture by drawing a broom across the surface.
4. Rough Broom Finish
  - a. The surface shall first be given a single float finish as specified above. Immediately after initial floating, it shall be given a coarse transverse scored texture by drawing a broom or burlap belt across the surface.

**3.06 EXTERIOR SLABS/PAVEMENTS, STAIRS, APRONS, ETC.**

- A. Exterior stairs, sidewalks, and the Building Apron Slab shall receive a light broom finish.
- B. The Garden Center Slab, Lumber Slab, and Stoops shall receive a medium broom finish.
- C. All other exterior slabs/pavements shall receive a rough broom finish.

**3.07 NON-SLIP FINISH**

- A. Where directed by Architect of Record, make all exterior ramps, curb cuts, step treads and landings non-slip by application of abrasive aggregate during concrete finishing process. Sprinkle abrasive aggregate by hand at the rate of not less than 1/4 lb. of aggregate per square foot. Sprinkle as soon as the freshly placed concrete will support the weight of workmen. Float into surface, and trowel.

**3.08 FLOOR SLAB JOINTS**

- A. General: Construction and contraction joints shall match the joint layout provided on the drawings. No exceptions.
  1. Construction Joints: Shall be located at the discretion of the Contractor except they are not to be located longitudinally in main aisles and observing the placement limits previously established.
- B. Sawed Joints:
  1. Use saws, blades, skid plates, and accessories from Soff-Cut International, Inc.
  2. Have two "Soff-Cut" saws minimum on site, with blades capable of achieving the required depth of saw cut.
  3. Start cutting sawed joints as soon as concrete has hardened sufficiently to prevent raveling or dislodging of aggregates.
  4. Install Velcro or other non-scratch material to base of skid plate to reduce surface scratching.
  5. For "Soff-Cut" saw, this will typically be from 1 hour in hot weather to 4 hours in cold weather after completing finishing of slab in that joint location.
  6. Capability: Employ sufficient number of saws and workers to complete cutting sawed joints before the time noted above and before shrinkage produces cracking.
  7. Use offset grinder with abrasive wheel or small diameter diamond blade to extend saw cut into column or perimeter isolation joint material.
  8. See Drawings for additional requirements.
- C. Saw-Cut Control Joint Dust Collection
  1. Connect a dust collection system directly to each Soff-Cut saw being used.
  2. Dust Collection System:
    - a. ProVac Dust Collection System PVG-55 by Glad Tech Inc.
    - b. SoffVac V-1000 by Soff-Cut International, Inc.
    - c. PulseVac A-404 by The PulseVac Company
  3. Remove all saw debris, either loose or compacted, from slab surface and joints prior to curing cover installation.

**3.09 CONCRETE CURING**

- A. General:
  1. Cure concrete in accordance with ACI 301 and ACI 308.1, except as noted.
  2. Start curing as soon as curing operations will not damage concrete surface.

**Construction Specification****SLAB ON GROUND**

3. Continuously moist cure concrete slabs unless Alternative Cold Weather Concreting Procedures have been approved, for at least 7 consecutive days, except as follows: For tilt-up wall buildings, the interior building slab at the tilt up wall panel locations shall be moist cured for at least 5 consecutive days, all other areas to be moist cured 7 consecutive days. Ensure the casting area is coated with bond breaker prior to constructing tilt panel forms.
4. During curing period, do not allow any part of concrete to become dry.
5. Do not use plain polyethylene sheets on exposed interior floors.
6. If using forms for curing, keep forms in contact with concrete wet during curing period unless type of form is impervious to water, such as metal or fiberglass.
7. If forms are removed before curing period is complete, continue curing immediately with other approved methods.

B. Methods of Curing: Cure concrete surfaces with following materials and methods:

1. Moist cure:
  - a. Moisten exposed surfaces of concrete after completing finishing and then apply sheet smoothly with no wrinkles or folds, pre-wetted, with edges lapped 6 inches minimum and sealed and secured in such manner as to prevent moisture escaping from concrete from laps or edges. Keep sheet moist during curing period. Rewet if required.
2. Alternative Cold Weather Concreting Procedures
  - a. Submit Materials, installation and removal procedures and chemical compatibility statements from suppliers for review and approval by Home Depot Project Manager and Architect of Record.
  - b. Contractor shall coordinate with PNA if this method is used to ensure PNA curing covers are not provided with the FBO package.
3. Liquid curing compounds sprayed or rolled uniformly on vertical slab edges only immediately following form removal operation.
  - a. Apply curing compound in accordance with manufacturer's recommendations.
  - b. Immediately recoat, at the rate specified above, surfaces subjected to rainfall within 3 hours after compound has been applied or surfaces damaged by subsequent construction operations within the curing period.

C. Concrete Protection:

1. Barricade concrete surfaces immediately after finishing.
2. Do not allow light traffic, except for curing purposes, on concrete surfaces until concrete has obtained 1800 psi compressive strength.
3. Do not allow heavy traffic on concrete surfaces until concrete has obtained its design strength noted on Drawings, by test.
4. Adequately protect concrete inserts and other embedded items from movement, mechanical injury or from damage by elements.
5. During concreting operations, protect adjacent placements from concrete splatter and spillage, scratches, scrapes and any other surface damage that will affect aesthetics.

### 3.10 FORM REMOVAL

A. General:

1. Do not remove forms until concrete has hardened sufficiently to support its own weight and imposed construction loads.
2. Remove forms in manner to avoid damage to concrete.

### 3.11 BONDING NEW CONCRETE TO EXISTING CONCRETE

A. Use this bonding procedure for bonding new concrete pads to existing concrete and as noted on Drawings.

B. Install as follows:

1. Roughen joint until coarse aggregate is exposed.
2. Clean surface.
3. Immediately before placing concrete, clean surface again as necessary, dampen surface, and remove free water.
4. Brush surface to be bonded with bonding grout.
5. Proportion grout to consist of 1 to 1 mixture of Portland cement and sand passing the No. 8 sieve and mixed with sufficient water to give thick paint-like consistency.

### 3.12 JOINT SEALING/FILLING: See Section 07901 – Joint Sealers/Fillers

### 3.13 LIQUID SURFACE TREATMENT

A. See Section 03360 - Special Concrete Floor Finishes for detailed information.

1. The General Contractor is to keep the areas that the liquid surface treatment and polished finish is being installed clear of other work and disturbances and must coordinate the work so as not to delay other work in progress.

3.14 ATTACHMENTS

A. The following attachment is part of this Section:

1. Slab on Ground Checklist

END OF SECTION

**CONCRETE SLAB ON GROUND CHECKLIST****Items to be completed 3 weeks minimum prior to concrete placement:**

ITEM:	DATE	BY
1. Have the concrete mix design forms been properly filled out and submitted to A/E?		
2. Has the slab pre-construction meeting been scheduled and all parties notified?		
3. Has the pre-construction meeting agenda been sent to all parties?		
4. Has the order for the diamond and plate dowels been placed?		
5. For slabs with reinforcement, has the order for the proper bar supports been placed?		
6. Has the slab construction placement schedule been developed?		
7. Has slab test placement been scheduled?		
8.		

**Items to be completed 2 weeks minimum prior to concrete placement:**

ITEM:	DATE	BY
1. Has the concrete mix design been approved?		
2. Has the pre-concrete construction conference taken place?		
3. Have all of the "action items" identified in the pre-construction meeting been completed?		
4.		

**Items to be completed 2 days before concrete placement**

ITEM:	DATE	BY
1. Inspect ready-mix concrete trucks and record acceptable truck numbers.		
2. Verify there will be two "soff-cut" saws on the project site (one will be for back-up but it also can be used for production).		
3. Arrange for Owner's ITC to be at the slab placement.		
4. Verify that evaporation retardant is on site and in sufficient quantities.		
5.		

**Items to be completed 1 day before concrete placement**

ITEM:	DATE	BY
1. Verify subgrade and base is well compacted, smoothed and base choked –off with fine aggregate (as identified on the drawings or in the geotech report).		
2. Has the subgrade and base been proof rolled and observed by the geotechnical representative?		
3. Have all of the soft spots identified by the proof rolling been repaired and retested?		
4. Has the slab thickness been verified and is the thickness uniform?		
5. For the slabs with reinforcement: A. Is the correct size and spacing installed?		

**Construction Specification****Section 03390  
SLAB ON GROUND**

ITEM:	DATE	BY
B. Does reinforcement have the specified cover from the top of the slab?		
C. Does the reinforcement have the proper lap splice length?		
D. Is the reinforcement securely tied to the proper number of bar supports?		
6. Have all of the reentrant corner and slab penetration reinforcing bars been installed with proper cover?		
7. Are dowel baskets in place or adjacent to placement area?		
8. Are dowel basket locations marked on subgrade / base and forms?		
9. Are Diamond Dowels at construction joints installed and properly aligned?		
10.		

**Items to be completed during concrete placement, finishing, and curing**

ITEM:	DATE	BY
1. Are the tests being performed on the concrete (air, slump, etc) at the proper time?		
2. Are the dowel baskets being placed in the proper locations and alignment?		
3. Is vibration being done under all dowels?		
4. Is power floating starting per 03390 Part 3?		
5. Is the evaporation retardant being used properly when needed?		
6. Is the proper steel trowel finish being achieved?		
7. Is curing being started immediately and continuing uninterrupted?		
8. Are the saw cuts being made at the appropriate time?		
9.		

**Items to be completed after concrete curing**

ITEM:	DATE	BY
1. If used, is the liquid surface treatment being properly applied at the correct time?		
2. Is the wheeled construction equipment diapered and have the appropriate tires to leave no skid marks?		
3. Are joints spalling due to construction traffic? If so, provide protection.		
4. At least one week before starting joint filling, notify Owner's special inspector. Do not allow filling unless inspector is present.		
5. Have the joints been properly filled and at the correct time?		
6.		



**PART 1 - GENERAL****1.01 SCOPE OF WORK**

- A. Include all labor, materials and appliances, and perform all operations in connection with the installation of the tilt-up panels and all related work incidental to the completion thereof, as shown on the drawings, complete, in strict accordance with the drawings and as specified herein.
- B. Scope of work shall include conveying concrete, all inserts, reglets, pipes, anchors, anchor bolts, sleeves, channel inserts, weld plates, plate anchors, shims and a solid bed of non-shrink non-ferrous grout under the wall panel unit.
- C. Fabricator of tilt-up wall panels shall be responsible for the design of all lifting hardware and for the design of tilt-up wall panels for lifting stresses and shall provide lifting inserts and any additional reinforcing steel required for lifting panels into place. The fabricator's engineer shall sign and seal all shop drawings for the tilt-up panels and lifting design drawings.
- D. No heavy equipment may be placed on the floor slab. Any cracking or damage to the floors caused by erection equipment, concrete trucks, etc. will require removal and replacement of the damaged or cracked areas at no additional cost to the Owner. All anchor bolts, joint spalls, scrapes, etc. are to be repaired to the satisfaction of the Owner's Representative.
- E. All depressions, block-outs, column diamonds, joints, etc. in floor slabs that are to be used for casting panels shall be filled with lean concrete on granular fill as required so as to develop a smooth uniform finish for the entire panel. Remove all lean concrete and granular fill after panel casting operation is finished.
- F. Related work specified elsewhere includes but may not be limited to:
  - 1. Section 01411: Testing and Inspection
  - 2. Section 03300: Cast-In-Place Concrete
  - 3. Section 03600: Non-Shrink Grout
  - 4. Section 05120: Structural Steel

**1.01 RELATED DOCUMENTS**

- A. Unless otherwise shown or specified, the work shall conform to the following standards and recommendations of the American Concrete Institute.

ACI 117	Standard Tolerances for Concrete Construction and Materials
ACI 211.1	Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete
ACI 212.2R	Guide for Use of Admixtures in Concrete
ACI 214	Recommended Practice for Evaluation of Strength Test Results of Concrete
ACI 302.1R	Guide for Concrete Floor and Slab Construction.
ACI 304R	Guide for Measuring, Mixing, Transporting, and Placing Concrete
ACI 304.2R	Placing Concrete by Pumping Methods
ACI 305R	Hot Weather Concreting
ACI 306R	Cold Weather Concreting
ACI 306.1	Standard Specifications for Cold Weather Concreting
ACI 308	Standard Practice for Curing Concrete
ACI 309R	Guide for Consolidation of Concrete
ACI 315	Details and Detailing of Concrete Reinforcement
ACI 318	Building Code Requirements for Reinforced Concrete
ACI 347R	Guide to Formwork for Concrete
ACI 551R	Tilt-Up Concrete Structures
- B. Unless otherwise shown or specified, the work shall conform to the following standards of the Concrete Reinforcing Steel Institute.
  - 1. Manual of Standard Practice, 28<sup>th</sup> Edition, 2009
  - 2. Placing Reinforcing Bars, 9<sup>th</sup> Edition, 2011

**1.01 SUBMITTALS TO ARCHITECT OF RECORD**

- A. Prepare and submit shop drawings for all units furnished under this section showing:
  - 1. Layout plan
  - 2. Method of handling
  - 3. Required openings and blockouts
  - 4. Type, size, and location of reinforcing
  - 5. Connection and anchorage details
  - 6. Member identification marks
  - 7. Other details required to complete this work

8. Each panel shall be completely dimensioned and detailed.
9. Shop drawings shall be signed and sealed by an engineer registered in the state where the structure is located.
- B. Submit certification by an engineer registered in the state where the structure is located certifying that all lifting hardware, inserts and reinforcing steel have been designed for all lifting and handling stresses.
- C. Samples: Submit samples for all special finishes/textures only. Samples shall be approximately 12" square and 2" thick representative of full range of color and texture.
- D. Submit concrete mix designs for review well in advance of concrete placement. Concrete mix design submittal shall include all strength data necessary to show compliance with the strength requirements Section 03300.
- E. Review of submittals will cover general design only. In no case shall this review relieve the contractor of the responsibility for design, general or detailed dimension, quality or quantity of materials, or any other conditions, functions, performance or guarantees required.
- F. Portland Cement suppliers shall submit to the Architect of Record, documentation of environmental policies upon request.

## 1.02 QUALITY ASSURANCE

- A. General
  1. It shall be the responsibility of the Contractor to produce concrete of the strength, durability, workability and specified finish.
  2. The Owner will employ and pay for the services of an Independent Testing Contractor (ITC) to provide testing and inspection of tilt-up panel work.
  3. The services of the ITC, and the information provided by the ITC, are provided for the sole benefit of Owner. The information is provided to Contractor only so the Contractor is aware of what is being reported to Owner. Contractor shall not, and is not entitled to, rely upon any information provided by the ITC in any manner. Contractor is solely responsible for assuring that the Work complies with the Contract Documents in all respects and may not rely on the ITC for this, or any other, assurance. The ITC and its representatives are not authorized to revoke, alter, relax, enlarge or release any requirements of the Contract Documents, approve or accept any portion of the Work, perform or excuse any duties of Contractor, or be a party to the scheduling of the Work. The ITC is not an authorized agent of the Owner with respect to the relationship between Owner and Contractor.
  4. Tilt-up panel materials and operations shall be tested and inspected as the work progresses. Failure to detect any defective work or material shall not in any way prevent later rejection (when such defect is discovered) nor shall it obligate the Owner for final acceptance.
  5. See Section 01411 Testing and Inspection for a complete description of the services to be performed by the ITC and additional Contractor responsibilities to facilitate that work.
- B. All liquid chemical products furnished in this section shall be VOC compliant for building location.

## PART 2 - PRODUCTS

### 2.01 CONCRETE MATERIALS

- A. Coarse Aggregate: ASTM C33.
- B. Fine aggregate: ASTM C33.
- C. Portland cement: ASTM C150, Type I or II.
- D. Water: Clear and free from injurious amounts of oil, acid, alkali, organic or other deleterious matter.
  1. Use recycled water when available in accordance with ASTM C94.
- E. Admixtures:
  1. Water reducing, retarding, and accelerating admixtures: ASTM C494, may be used at the contractor's option.
  2. Air-entraining admixture: ASTM C260, for all air-entrained concrete.
  3. Maximum chloride ion due to admixtures shall not exceed 0.05% by weight.
  4. The addition of calcium chloride is not permitted.
  5. All admixtures shall be used in conformance with the manufacturer's recommendations.

### 2.02 REINFORCEMENT MATERIALS

- A. Reinforcing Steel Bars: ASTM A615, Grade 60, unless noted otherwise. ASTM A706 grade 60 when reinforcing is welded.
- B. Reinforcing Couplers:
  1. Erico International Corporation: LENTON Weldable Couplers C2/C3J

Erico International Corporation  
3460 Solon Rd.  
Solon, OH 44139  
Tel (440) 248-0100, Fax (440) 248-0723

- C. Steel Wire: ASTM A82
- D. Bar Supports: Hot-dipped galvanized or plastic protected.

## 2.03 RELATED MATERIALS

- A. Forms shall be wood, metal or other approved material, and shall be reused to the greatest extent possible.
- B. Anchors and Insets: Provide insets, dowels, bolts, nuts, washers, and other items shown to be cast in panels or required for connecting panels to adjacent work, including insets required for pick up.
  - 1. Structural Steel Shapes: ASTM A 36.
  - 2. Malleable Iron Castings: ASTM A 47, Grade 32510.
  - 3. Carbon Steel Castings: ASTM A 27, Grade 60-30.
  - 4. Stainless Steel Anchors: ASTM A 167, Type 301, Mill finish.
  - 5. Hot Dip Galvanized Iron and steel anchors and insets and connecting devices: ASTM A 153.
- C. Curing Bondbreaker: Compatible with Curing, Sealing, and Hardening Compounds used for slab on grade.
- D. Curing Compound:
  - 1. Conform to ASTM C 1315, Type 1, Class A.
  - 2. 25% minimum solids content, VOC compliant.
  - 3. Approved Products and Manufacturers (confirm compliance with local authorities):
    - a. Edoco: Burke 1315 Cure Seal WB
    - b. Euclid Chemical Co.: Super Diamond Clear VOX
  - 4. Dissipating (Removable) Curing Compounds and Manufacturers – when required for compatibility of finish treatments, paints, or coatings:
- E. Form Releasing Agent: Non-staining
  - 1. Dayton Superior: Clean Strip J1A
- F. Grout: Non-Shrink Grout as specified under section 03600
- G. Form liners (when applicable): Provide form liners to produce panel finishes on drawings.
- H. Slab protection angle:
  - 1. Victory Bear: "Slab Saver"  
7631 Progress Court  
CenterPoint 70 Commerce Park  
Huber Heights, OH 45424  
Phone: (937) 236-7288, Fax: (937) 236-7289  
Contact: Mark Brown, Direct Dial: (513) 617-0131  
e-mail: [mbrown@fukuvi-usa.com](mailto:mbrown@fukuvi-usa.com)
- I. Multipolymer Plastic Shim Packs:
  - 1. Minimum size: 4" x 6" x 1 9/16" thick (one 1/16<sup>th</sup>, two 1/8<sup>th</sup>, and five 1/4" plys)
  - 2. Minimum compressive strength of 8,000 psi
  - 3. Negligible cold flow characteristics: i.e. less than 1 % at 1,000 psi and 73° F, for 10,000 hrs.
  - 4. Approved Manufacturer:
    - a. Meadow Burke: Super Shims

## PART 3 - EXECUTION

### 3.01 CONCRETE PROPORTIONS

- A. The specified compressive strength of the concrete, f<sub>c</sub>, shall be as designated on the drawings. Strength requirements shall be based on 28-day compressive strength.
- B. Slump of concrete shall not exceed 4" at point of placement unless a high range water-reducing admixture is used. The slump of concrete prior to addition of a high range water-reducing admixture shall not exceed 4". The slump of concrete containing a high range water-reducing admixture shall not exceed 8".

- C. The maximum size of coarse aggregate shall not be more than one-third of the depth of tilt-up panels, nor three-fourths of the minimum clear spacing between reinforcing bars.
- D. The maximum coarse aggregate size shall be #57 stone with 100% passing a 1 1/2" sieve.
- E. The minimum cement content shall be 611 lbs./cu. yd.

### 3.02 FORMWORK

- A. Forms shall be used, as necessary, to confine the concrete and shape it to the required dimensions. Forms shall have sufficient strength to withstand the pressure resulting from placement and vibration of the concrete, and shall have sufficient rigidity to maintain specified tolerances.
- B. The design and engineering of the formwork, as well as its construction, shall be the responsibility of the contractor.
- C. Forms shall be sufficiently tight to prevent loss of mortar from the concrete.
- D. All exposed concrete corners shall have a 3/4" x 3/4" chamfer, except as otherwise noted.
- E. Forms shall be coated with non-staining releasing agent, applied before the reinforcing steel is placed.
- F. Forms shall not be disturbed until the concrete has adequately hardened. Care shall be taken to avoid spilling the concrete surfaces.
- G. All surfaces of forms and embedded materials shall be cleaned of any accumulated mortar or grout from previous concreting and of all other foreign material before concrete is placed in them.

### 3.03 REINFORCEMENT

- A. For fabrication, placing, cleaning and protection of steel reinforcing see 03300 Cast-in-Place Concrete.
- B. Reinforcing shall be placed so that a concrete cover of 1" is provided, unless noted otherwise.

### 3.04 PRODUCTION OF CONCRETE

- A. For production of concrete see 03300 "Cast-in-Place Concrete."

### 3.05 FABRICATION

- A. Preparation for Placing Concrete
  - 1. Before concrete is placed, all debris and ice shall be removed from the spaces to be occupied by the concrete. Remove surplus form releasing agent from the contact face of forms. Forms shall be thoroughly cleaned of ice or other coatings.
  - 2. Water, mud, snow and ice shall be removed from place of deposit before concrete is placed.
  - 3. Notify all trades concerned and the Owner's Representative sufficiently in advance of the scheduled time for concrete placement to permit installation of all required work by other trades.
  - 4. Before placing concrete, all required embedded items, including dovetail anchor slots, anchors, inserts, curb angles, metal frames, fixtures, sleeves, drains, accessory devices for Mechanical and Electrical installations shall be properly located, accurately positioned and built into the construction, and maintained securely in place.
  - 5. Build into construction all items furnished by the Owner and other trades. Provide all offsets, pockets, slabs, chases and recesses as job conditions require.
  - 6. Apply bondbreaker to slab on ground or casting bed in accordance with manufacturer's recommendations. Bondbreaker shall be compatible with the Curing and Sealing Compound used for slab on ground. See Section 03300 and Section 03390.
  - 7. Place and properly support reinforcing steel.
- B. Conveying
  - 1. For conveying of concrete see 03300 "Cast-in-Place Concrete."
- C. Depositing
  - 1. For depositing of concrete see 03300 "Cast-in-Place Concrete."
- D. Finish
  - 1. All exposed concrete edges shall be chamfered at edges. Chamfer to be 3/4".
  - 2. All faces shall be true, well defined surfaces. Warped, cracked, broken, spalled, stained or otherwise defective units will be rejected.

3. Exterior face of panels shall be cast down to avoid the appearance of lifting devices on the exterior panel surface. Panel finish (both sides) shall be smooth and clean, ready to receive specified finish. Curing compounds and bondbreakers, which are not compatible with the specified finish, shall be removed from the tilt-up panels.
4. Interior face to have a steel trowel finish.

E. Casting Tolerances

1. Overall height and width:
  - a. 10 feet or under:  $\pm 1/8"$
  - b. 10 feet to 20 feet:  $+ 1/8"$  and  $- 3/16"$
  - c. 20 feet to 30 feet:  $+ 1/8"$  and  $- 1/4"$
  - d. Each additional 10 feet:  $\pm 1/16"$  per 10 ft.
2. Angular deviation of plane of side mold:  $1/16"$  per 6" depth, but at least  $1/16"$ .
3. Thickness:  $+ 1/4"$  and  $- 1/8"$
4. Openings:  $\pm 1/4"$
5. Out of square (difference in length of the two diagonals)  $1/8"$  per 6 feet or  $1/4"$  total, whichever is greater.
6. Bowing and warpage tolerance:  $1/360$  of panel dimension.

3.06 ERECTION

- A. Erector Qualifications: Have at least two years of successful experience in erection of tilt up wall panels, similar to size and amount as required for this project.
- B. Tilt-up panels shall not be lifted until the concrete has attained the minimum compressive strength required by the lifting engineer. The ITC shall make job cured cylinders at the Contractor's expense to verify lifting strength. The panels shall not be lifted earlier than 72 hours after the concrete is placed without approval of both the lifting engineer and the Structural Engineer of Record.
- C. Tilt-up panels shall be lifted and supported during manufacturing, stock piling, transporting and erection operations only at the lifting or support points, or both and with the lifting devices embedded in the members by the fabricator.
- D. Fabricator shall be solely responsible for providing any additional reinforcement steel for the manufacturer, handling, storage, transportation and erection of all tilt-up panels. Reinforcement steel shown on the plans represents minimum acceptable quantity for erected in-place panels.
- E. Transportation, site handling and erection shall be performed by qualified personnel with acceptable equipment and methods.
- F. Prior to erection, check all bearing surfaces for elevation, alignment and location. Report any discrepancies to the Architect of Record for correction. Proceeding with erection implies acceptance of existing conditions.
- G. Erection shall include, but not be limited to:
  1. Placing, aligning and leveling the members in final position in the structure.
  2. All shims and grouting of panels to bring to proper elevation and alignment.
  3. All anchors, clip angles, plates, bolts, fastening devices, etc., to anchor wall panels to structural steel. All anchorage devices shall be removable, shall permit movement caused by thermal stresses and shall be subject to the approval of the Architect of Record.
  4. Remove any lifting hooks.
  5. Provide adequate bracing until all structural steel, purlins, beams, joist and deck is placed, backfill placed and floor slab leave out placed.
  6. All channels, angles, clips, etc., below grade, shall be encased in 3" of concrete.
- H. Damaged units:
  1. Any members superficially damaged during erection shall be rejected or shall be repaired by experienced workmen if approved by the Architect of Record.
  2. Units badly damaged shall be rejected and shall be replaced by the manufacturer.
  3. The Architect of Record shall be the sole judge of this damage and repair.
- I. Erection tolerances:
  1. Face width of joint.
    - a. Panel dimension (normal to joint) 10 ft.:  $\pm 3/16"$ .
    - b. Panel dimension (normal to joint) 10 ft. to 20 ft.:  $+3/16$  and  $-1/4"$ .
    - c. Each additional 10 ft.:  $\pm 1/16"$ .
  2. Panel alignment:  $1/4"$ . (Maximum difference in any direction between adjacent panels).
  3. Location of openings:  $\pm 1/4"$ .

3.07 CURING AND PROTECTION

- A. Beginning immediately after placement, tilt-up panels shall be protected from premature drying, excessively hot or cold temperatures, and mechanical injury, and shall be maintained with minimal moisture loss at a relatively constant temperature for the period necessary for hydration of the cement and hardening of the concrete.
- B. For concrete surfaces not in contact with forms, apply curing compound immediately after completion of placement and finishing. The compound shall be applied in accordance with the recommendations of the manufacturer immediately after any water sheen, which may develop after finishing has disappeared from the concrete surface. For any surface against which additional concrete or other material is to be bonded or finish applied, unless it is proven that the curing compound and/or bond breaker will not prevent bond and is compatible with the finish, positive measures shall be taken to remove it completely from areas to receive bonded applications or finish.
- C. Temperature, Wind, and Humidity
  - 1. For hot and cold weather procedures see 03300 "Cast-in-Place Concrete."
- D. Protection from mechanical injury - During the curing period, the concrete shall be protected from damaging mechanical disturbances, such as load stresses, heavy shock, and excessive vibration. All finished concrete surfaces shall be protected from damage by construction equipment, materials, or methods, by application of curing procedures, and by rain or running water.

### 3.08 EVALUATION AND ACCEPTANCE OF CONCRETE

- A. For evaluation and acceptance of concrete see 03300 "Cast-in-Place Concrete."

### 3.09 ACCEPTANCE OF TILT-UP PANELS

- A. Completed tilt-up panels, which meet all applicable requirements, will be accepted without qualification.
- B. Completed tilt-up panels which fail to meet one or more requirements but which has been repaired to bring it into compliance will be accepted without qualification.
- C. Completed tilt-up panels which fail to meet one or more requirements and which cannot be brought into compliance may be accepted or rejected by the Owner's Representative. In this event, modifications may be required to assure that remaining work complies with the requirements.
- D. The cost of any additional tests or analysis, including additional architectural and engineering services, performed to prove the adequacy of the concrete work, shall be borne by the contractor.

END OF SECTION

**PART 1 - GENERAL****1.01 SCOPE OF WORK**

- A. Include all labor, materials and appliances, and perform all operations in connection with the installation of Non-Shrink Grout, and all related work incidental to the completion thereof, as shown on the drawings and as specified herein. Non-Shrink Grout work includes: structural grouting below column base plates and below tilt-up concrete wall panels.
- B. Related work specified elsewhere includes but may not be limited to:
  - 1. Section 01411: Testing and Inspection
  - 2. Section 03300: Cast-In-Place Concrete
  - 3. Section 03470: Tilt-up Concrete Wall Panels
  - 4. Section 05120: Structural Steel

**1.02 RELATED DOCUMENTS**

- A. Unless otherwise shown or specified, the work shall conform to the following standards of the American Society for Testing and Materials, latest editions adopted.
  - 1. ASTM C 109 Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in or 50-mm Cube Specimens)
  - 2. ASTM C 309 Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
  - 3. ASTM C 827 Test Method for Early Volume Change of Cementitious Mixtures
  - 4. ASTM C 1090 Test Method for Measuring Changes in Height of Cylindrical Specimens from Hydraulic-Cement Grout
  - 5. ASTM C 1107 Specification for Packaged Dry, Hydraulic-Cement Grout (Non-shrink)
- B. Unless otherwise shown or specified, the work shall conform to the following standards of the US Army Corps of Engineers (COE)
- C. CRD-C 621 Specification for Non-Shrink Grout

**1.03 DELIVERY, STORAGE, AND HANDLING**

- A. Prepackaged materials shall be delivered and stored in the manufacturer's original containers, clearly labeled.
- B. Store materials in a dry area at a temperature between 40 and 100 degrees F.
- C. Follow manufacturer's recommendations for storage and handling prior to use.

**1.04 PROJECT CONDITIONS**

- A. Maintain temperature between 45 and 90 degrees F during placement and throughout curing period.

**1.05 QUALITY ASSURANCE**

- A. The Owner will employ and pay for the services of an Independent Testing Contractor (ITC) to provide testing and inspection of non-shrink grout work.
- B. The services of the ITC, and the information provided by the ITC, are provided for the sole benefit of Owner. The information is provided to Contractor only so the Contractor is aware of what is being reported to Owner. The Contractor shall not, and is not entitled to, rely upon any information provided by the ITC in any manner. Contractor is solely responsible for assuring that the Work complies with the Contract Documents in all respects and may not rely on the ITC for this, or any other, assurance. The ITC and its representatives are not authorized to revoke, alter, relax, enlarge or release any requirements of the Contract Documents, approve or accept any portion of the Work, perform or excuse any duties of Contractor, or be a party to the scheduling of the Work. The ITC is not an authorized agent of the Owner with respect to the relationship between Owner and Contractor.
- C. Grout materials and operations shall be tested and inspected as the work progresses. Failure to detect any defective work or material shall not in any way prevent later rejection (when such defect is discovered) nor shall it obligate the Owner for final acceptance.
- D. See Section 01411 Testing and Inspection for a complete description of the services to be performed by the ITC and additional Contractor responsibilities to facilitate that work.

**1.06 QUALITY CONTROL**

**Construction Specification****NON-SHRINK GROUT**

- A. All liquid chemical products furnished in this section shall be VOC compliant for building location.

**1.07 GUARANTEE**

- A. Contractor shall guarantee entire installation for one year, or as specified herein, from date of final acceptance by the Owner.

**PART 2 - PRODUCTS****2.01 NON-SHRINK GROUT**

- A. Packaged dry, cement based, non-shrink, non-corrosive, non-metallic, grout.
- B. Pumpable and pourable
- C. Meet ASTM C 1107 (grade C) and COE CRD-C 621.
- D. Performance Requirements:
1. Compressive Strength:

Days	Strength (psi)
1	1000
3	2500
14	3500
28	5000

2. Expansion characteristics when tested per ASTM C 827 and ASTM C 1090:

Test	Min. Height Change (percent)	Max. Height Change (percent)
ASTM C 827 @ Final Set	0.00	+4.00
ASTM C 1090 @ 1, 3, 14, and 28 days	0.00	+0.3

- E. Approved products and manufacturers:
1. Dayton Superior Corporation: 1107 Advantage Grout
  2. Euclid Chemical Company: NS Grout
  3. Master Builders Solutions (BASF) MasterFlow 100

**2.02 WATER**

- A. Follow manufacturers recommendation for proportioning.
- B. Provide water clear and free from injurious amounts of oil, acid, alkali, organic or other deleterious matter.
1. Use recycled water when available in accordance with ASTM C94.

**2.03 CURING COMPOUND**

- A. Must meet ASTM C 309 with 25% solids, minimum
- B. Approved products and manufacturers:
1. Dayton Superior Corporation : Cure & Seal LV 25% J20 UV
  2. Euclid Chemical Company: Super Rez Seal
  3. Sonneborn (BASF): Kure N Seal WB 30

**PART 3 - EXECUTION****3.01 PREPARATION**

- A. Prepare surfaces that will be in contact with grout according to the manufacturer's instructions.
- B. Ensure surfaces are clean.
- C. Remove dirt, dust, oil, grease, debris, rust, mill scale, sealers, paint, and unsound concrete.



- D. Build forms according to manufacturer's instructions. Install forms to contain liquid grout. Seal joints and corners.

### 3.02 INSTALLATION

- A. Follow manufacturer's instructions for mixing and placing.
- B. Do not add water in an amount that will cause bleeding or segregation of mixed grout.
- C. Just prior to grouting, thoroughly saturate concrete surfaces for 24 hours; remove excess water.
- D. Place grout continuously by most practical means. Work from one side to avoid entrapped air.
- E. Grout may be rodded or tamped, but do not vibrate.
- F. Apply curing compound to exposed grout in accordance with manufacturer's instructions or cure with wet burlap for 3 days.

END OF SECTION

**PART 1 - GENERAL****1.01 DESCRIPTION OF WORK**

- A. This section includes furnishing materials, mixing and application of mortar and grout for masonry work.

**1.02 RELATED DOCUMENTS**

- A. Related work specified elsewhere includes but may not be limited to:

1. Section 04200: Brick Masonry
2. Section 04230: Reinforced Unit Masonry

**1.03 QUALITY ASSURANCE**

- A. The Owner will employ and pay for the services of an Independent Testing Contractor (ITC) to provide testing and inspections of the masonry work.
- B. The services of the ITC, and the information provided by the ITC, are provided for the sole benefit of Owner. The information is provided to Contractor only so the Contractor is aware of what is being reported to Owner. The Contractor shall not, and is not entitled to, rely upon any information provided by the ITC in any manner. Contractor is solely responsible for assuring that the Work complies with the Contract Documents in all respects and may not rely on the ITC for this, or any other, assurance. The ITC and its representatives are not authorized to revoke, alter, relax, enlarge or release any requirements of the Contract Documents, approve or accept any portion of the Work, perform or excuse any duties of Contractor, or be a party to the scheduling of the Work. The ITC is not an authorized agent of the Owner with respect to the relationship between Owner and Contractor.
- C. Masonry materials and operations shall be tested and inspected as the work progresses. Failure by the ITC to detect any defective work or material shall not in any way prevent later rejection (when such defect is discovered) nor shall it obligate the Owner for final acceptance.
- D. See Section 01411 Testing and Inspection for a complete description of the services to be performed by the ITC and additional Contractor responsibilities to facilitate that work.

**1.04 PRODUCT DELIVERY, STORAGE AND HANDLING**

- A. Deliver materials, except aggregate, to site in good condition, in original unopened containers displaying product name, type and grade, and mixing instructions. Inspect materials upon delivery and replace damaged or contaminated materials.
- B. Store materials to prevent inclusion of foreign materials, Cement, lime and admixtures shall be stored above ground level and covered for protection from moisture and contamination.

**1.05 GUARANTEE**

- A. Contractor shall guarantee entire installation for one year from date of the Grand Opening.

**PART 2 - PRODUCTS****2.01 MATERIALS**

- A. Portland Cement: ASTM C 150, Type II, natural color, non-staining.
- B. Masonry Cement: ASTM C 91, Type II, non-staining with maximum 12% air content by volume.
- C. Hydrated Lime: ASTM C 207-91, Type S.
- D. Quicklime: ASTM C 5-79(1997), slaked and aged in accordance with Appendix to ASTM C 5.
- E. Aggregate for Mortar: Natural Sand, ASTM C 144-99, clean, natural washed sand.
- F. Aggregate for Masonry Grout: ASTM C 404-97.
- G. Mortar Color: Match color of concrete block for structural CMU. Refer to drawings for architectural CMU and/or brick mortar colors. Submit colored mortar samples to Architect of Record.

**Construction Specification****MORTAR AND GROUT**

- H. Moisture Resistant Admixed: Unless prepackaged mortar with an integral waterproofing admixture is used, provide one of the following:
1. Lambert Corporation: Acrylbond
  2. Sonneborn: Hydrocide Powder
  3. Euclid Chemical Co.: Integral Waterpeller
- I. Water Reducing and Plasticizing Admixture, Acceptable Products:
1. Lambert Corporation: Acrylbond
  2. Sonneborn: Trimix
- J. Water: Clean, potable, free from excessive amounts of acids, alkalies, organic and other deleterious materials.
- K. Commercial Cement Grout, Acceptable Products:
1. Dayton Superior: 1107 Advantage Grout
  2. Edoco: Burke Multi Purpose Grout
  3. Euclid Chemical Co.: NS Grout
  4. MBT Protection and Repair: Construction Grout

**2.02 MORTAR PROPORTIONS**

- A. Types of Mortar:

<u>Type Mortar</u>	<u>Min. Compressive Strength At 28 Days</u>
M	2500 PSI
S	1800 PSI
N	750 PSI

- B. Mortar mixes may vary slightly to compensate for admixes and pumping requirements. Any changes shall be approved by the Architect. Responsibility for providing pumpable mix and for meeting the strength requirements rests with the Contractor. Mortar proportions by volume shall be as follows:

<u>Type Mortar</u>	<u>Aggregate Cu.Ft.</u>	<u>Portland Cu.Ft.</u>	<u>Hydrated Lime Cu.Ft.</u>
M	1	None	1/4
	1	1	None
S	1	None	Over 1/4 to 1/2
	1/2	1	None
N	1	None	Over 1/4 to 1/2
	None	1	None

Aggregate or Lime Putty measured in damp condition shall not be less than 3 times the sum of the volumes of cement lime used.

- C. Mixing: Mortar shall be mixed in a mechanically operated mortar mixer for at least three minutes after all ingredients are in the drum, and at least long enough to make a thorough, complete intimate mix of the materials. The required slump shall be 2-3/4 + 1/4" using truncated cone of 4"x 2"x 6" high.
- D. Tempering: The consistency of mortars shall be adjusted to the satisfaction of the mason, and water shall be added as is necessary or convenient in using the mortar. This should be done by forming a basin in the mortar, adding water and mixing it in, not by splashing water over the surface. Mortar in which a final set has begun so that it has become harsh shall not be used.

**2.03 GROUT PROPORTIONS**

- A. Grout mixes may vary slightly to compensate for admixtures and pumping requirements. Any changes shall be approved by the Architect. Responsibility for providing a pumpable mix and for meeting the strength requirements rests with the Contractor. Group proportions by volume as follows:

Type: Minimum Portland Cement or Portland Blast-Furnace Slag Cement:	Hydrated Lime or Lime Putty:	Aggregate measured in a Damp Loose Condition:	
		<u>Fine</u>	<u>Coarse</u>
Fine 1	0 to 1/10	2-1/4 to 3 times the sum of the volume of the cementations materials	---
Course 1	0 to 1/10	2-1/4 to 3 times the sum of the volume of the cementations materials	1 to 2 times the sum of the volume of the cementations materials

- B. Fine grout shall be used in spaces less than 2" in any horizontal dimension or in which clearance between reinforcing and masonry is less than 1".
- C. Mixing: All ingredients shall be measured according to the specified portions for the batch and mixed in a mechanically operated batch mixer. The grout shall be mixed for a period of at least three minutes after all ingredients for the batch are in the drum. The drum must be completely emptied before the succeeding batch of materials is placed therein. The required slump shall be 10" minimum.
- D. Tempering: The consistency of grout shall be adjusted so it will flow immediately into place without segregation of ingredients. Water may be added to compensate for loss, but grout that has begun final set and become harsh shall not be used.

### PART 3 - EXECUTION

#### 3.01 MORTAR

- A. Conform to proportion specifications of ASTM C-270-00 for mortar types. See Drawings for type of mortar to be used. Do not use mortar one hour after initial water has been added to the mix.
- B. Place mortar as directed in sections that follow for each specific type masonry specified.
- C. Re-tempering: Not permitted.
- D. Antifreeze agents not permitted.

#### 3.02 GROUTING

- A. Grout shall comply with ASTM C 476-01.
- B. Limitations for erection and grouting of masonry walls to be constructed by low lift grouting methods as follows:

<u>Erection</u>	<u>Hollow Unit Masonry</u>
Minimum size core	2 in. minimum dimension 6 sq. in. minimum area
Maximum height masonry lift	8 ft.
Maximum height grouted lift	4 ft.

- C. Limitations for erection and grouting of masonry walls to be constructed by the high lift grouting method as follows:

<u>Erection</u>	<u>Hollow Unit Masonry</u>
Minimum size core	3 in. minimum dimension 10 sq. in. minimum area
Maximum height masonry lift	80 times minimum cell dimension
Maximum height grouted lift	4 ft.

- D. Mortar shall not protrude into spaces designed to be filled with grout.
- E. Minimum mortar curing time before low lift grouting should be 24 hours and before high lift grouting three days in hot weather and five days in cold weather. Walls shall not be wetted during the curing period unless necessary. If weather conditions require, walls shall be kept damp with water from a fogging nozzle, but shall not be wetted to the point that free water drops

from the surface.

- F. Grout shall be placed in final position by means of an approved grout pump capable of handling at least 13 cubic yards of grout before any initial set occurs and in no case more than 1-1/2 hours after water has been added.
- G. Cells may be filled solid with grout either by low-lift grouting or high-lift grouting as specified hereinafter. A "lift" is the height of grout placed in one continuous operation from foundation or cold joint of previous lift to top of cell or cold joint forming bottom of subsequent lift.
- H. Grout shall be consolidated by puddling or mechanical vibrating during place and reconsolidated by again puddling after excess moisture has been absorbed by the masonry but before plasticity is lost.
- I. When the grouting is stopped for one hour or longer, horizontal construction joints shall be formed by stopping the placing of grout 1-1/2" above or below bed joint.
- J. All reinforcing shall be in place prior to grouting. Vertical reinforcing bars shall be held in position at the top, bottom and at intervals not farther apart than 192 bar diameters.
- K. When high lift grouting is used, clean out openings of 12 square inches shall be provided at the bottoms of all cells to be filled at each lift. Any overhanging mortar or other obstruction or debris shall be removed from the insides of such cell walls. Flush cells clean with water prior to grouting. After inspection and approval of the cells by the masonry inspector and the Architect of Record, the clean-outs shall be sealed before grouting. Cuts shall be made with masonry saw. Cutout pieces or masonry pieces of the same texture as the unit to be repaired and of the same sizes as the cutout holes shall be used for sealing the clean out openings.
- L. The length of time for waiting period between grouting lifts varies with the weather conditions and shall be determined by the masonry inspector. The waiting period allows water to be absorbed by the masonry and hence reduce hydrostatic pressure.
- M. Re-tempering: Not permitted.

### 3.03 TESTING AND INSPECTION

- A. Reinforcing steel shall be inspected prior to grouting. Architect shall be notified 48 hours in advance.
- B. High lift grouting shall be continuously inspected by the ITC.

### 3.04 CLEANING UP

- A. All cylinders and prisms shall be labeled with a record of the date cast and location in the structure and shall be moist cured at the job site and delivered to the ITC for 7 day and 28 day compression tests.
- B. Mortar shall be tested in three mortar cylinders, 2" diameter x 4" high, and shall be representative of each day's mortar.
- C. Grout shall be tested in three prisms, 3-1/2" x 3-1/2" x 7", representative of each day's grouting, or each 50 cubic yards of grout placed, whichever is smaller.
- D. Core tests will be performed if the grout or mortar fails to meet the specified requirements or if required by the Architect. Cores shall be cut from areas where defective materials were used and shall be tested for compressive strength.

END OF SECTION

**PART 1 - GENERAL****1.01 RELATED DOCUMENTS:**

- A. Drawings and General provisions of contract include but are not necessarily limited to, General, Supplementary conditions and Division 1 Specification section.
- B. Related work specified elsewhere includes but may not be limited to:
  - 1. Section 01012: Preferred Purchasing
  - 2. Section 04100: Mortar and Grout
  - 3. Section 07180: Water Repellent

**1.02 PREFERRED PURCHASING**

- A. Unless noted otherwise, Contractor and all subcontractors are encouraged to purchase all products listed in this specification section from a local The Home Depot Store. For more information, refer to Section 01012.

**1.03 DESCRIPTION OF WORK:**

- A. Extent of each type of masonry is indicated on the drawings.
- B. Types of masonry work required include, but is not limited to: Brick Masonry.

**1.04 QUALITY ASSURANCE**

- A. Use adequate numbers of skilled workman who are thoroughly trained and experienced in the necessary crafts, and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Comply with standards specified in this Section and these Specifications.
- C. The Owner will employ and pay for the services of an Independent Testing Contractor (ITC) to provide testing and inspections of the masonry work.
- D. The services of the ITC, and the information provided by the ITC, are provided for the sole benefit of Owner. The information is provided to Contractor only so the Contractor is aware of what is being reported to Owner. The Contractor shall not, and is not entitled to, rely upon any information provided by the ITC in any manner. Contractor is solely responsible for assuring that the Work complies with the Contract Documents in all respects and may not rely on the ITC for this, or any other, assurance. The ITC and its representatives are not authorized to revoke, alter, relax, enlarge or release any requirements of the Contract Documents, approve or accept any portion of the Work, perform or excuse any duties of Contractor, or be a party to the scheduling of the Work. The ITC is not an authorized agent of the Owner with respect to the relationship between Owner and Contractor.
- E. Masonry materials and operations shall be tested and inspected as the work progresses. Failure by the ITC to detect any defective work or material shall not in any way prevent later rejection (when such defect is discovered) nor shall it obligate the Owner for final acceptance.
- F. See Section 01411 Testing and Inspection for a complete description of the services to be performed by the ITC and additional Contractor responsibilities to facilitate that work.

**1.05 SUBMITTALS TO ARCHITECT OF RECORD**

- A. Product Data: Submit manufacturer's product data for each type of masonry unit, accessory, and other manufactured products, including certifications that each type complies with specified requirements.
- B. Samples: Submit manufacturers color and texture samples to match colors indicated on drawings

**1.06 DELIVERY, STORAGE AND HANDLING:**

- A. Delivery masonry materials to project in undamaged condition.
- B. Store and handle masonry materials to project in undamaged condition.
- C. Store and handle masonry unit to prevent their damage due to moisture, temperature changes, contaminants, corrosion or other causes.
- D. Store masonry accessories including metal items to prevent deterioration by corrosion and accumulation of dirt.

**1.07 PROJECT CONDITIONS:**

- A. Protection of Work: During erection, cover top of walls with waterproof sheeting at end of each day's work. Cover partially completed structures when work is not in progress. Extended cover a minimum of 24 inches both sides and holds cover securely in place.
- B. Do not apply uniform floor or roof loading for at least 12 hours after building masonry walls of columns, and concentrated loads for at least (3) days after building masonry walls or columns.
- C. Staining: Prevent grout or mortar or soil from staining the face of masonry to be left exposed or painted. Remove immediately grout or mortar in contact with such masonry.

**1.08 COLD WEATHER PROTECTIONS:**

- A. CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR THE PROTECTION OF THE WORK.
- B. Do not lay masonry units that are wet or frozen.
- C. Remove any ice or snow formed on masonry bed by carefully applying heat until top surface is dry to the touch.
- D. Remove masonry damaged by freezing conditions.
- E. Protect completed masonry and masonry not being worked on.
- F. Protect masonry from rain or snow for at least 24 hours by covering with weather-resistive membrane.

**1.09 HOT WEATHER REQUIREMENTS:**

- A. Protect unit masonry work when temperature and humidity conditions produce excessive evaporation of water from mortar and grout. Provide artificial shade and windbreaks and use called materials as required. Do not apply mortar to substrates with temperatures of 100 ° F (38 deg C) and above.

**PART 2 - PRODUCTS****2.01 FACE BRICK:**

- A. General: Comply with referenced standards and other requirements indicated below applicable to each form of brick required.
- B. Size: Provide bricks manufactured **per the following:**
  - 1. Size: Refer to drawings for nominal brick sizes.
  - 2. For sill, caps and similar applications resulting in exposure of brick surfaces which otherwise would be concealed from view, provide un-cored or unfrogged units with all exposed surfaces finished.
- C. Face brick: ASTM C 216, Grade SW.
- D. Texture and Color: Refer to drawings for brick manufacturer's product identification.

**2.02 JOINT REINFORCEMENT, TIES AND ANCHORING DEVICES:**

- A. Materials: Comply with requirements indicated below for basic materials and with requirements indicated under each form joint reinforcement, tie and anchor for size and other characteristics:
  - 1. Masonry Veneer Anchors: Galvanized Veneer Anchor Screw-On straps with triangle ties by Dur-O-Wall or approved equal. Place at 24" c.c. both horizontally and vertically.
  - 2. Dovetail Anchors: when dovetail grooves are provided in concrete panel, use Galvanized Dovetail Triangular Tie by Dur-O-Wall or approved equal. Place at 24" c.c. both horizontally and vertically.

**2.03 CONCEALED FLASHING MATERIALS:**

- A. Rubberized Asphalt Sheet Flashing: Manufacturer's standard composite flashing product consisting of 32 mil-thick pliable and highly adhesive rubberized asphalt compound bonded completely and integrally to 8 mil-thick, high-density, cross-laminated polyethylene film to produce an overall thickness of 40 mils as manufactured by W.R. Grace & Co. Or approved equal.
- B. Adhesive For Flashing: Of type recommended by manufacturer flashing material for use indicated.

**2.04 MORTAR AND GROUT MATERIALS**

- A. Refer to Section 04100

**2.05 MISCELLANEOUS MASONRY ACCESSORIES:**

- A. Remolded Expansion And Control Joint Strips: "Regular" Rapid Control Joint manufactured by Dur-O-Wall or approved equal, designed to fit standard sash block and to maintain lateral stability in masonry wall.
- B. Weepholes:
  - 1. Through masonry only: 1/4" sash cords, length to coordinate with thickness of wythe; or Weep vents (color to match mortar).
  - 2. Tubing not permitted.
- C. Masonry Cleaners:
  - 1. Acidic Cleaner: Manufacturer's standard strength general purpose cleaner designed for new masonry surfaces of type indicated; composed of blended organic and inorganic acids combined with special wetting systems and inhibitors; expressly approved for intended use by manufacturer or masonry unit being cleaned. Clean brick and prepare surfaces for paint as per requirements of paint manufacturer.
  - 2. Acceptable manufacturers and products:
    - a. Prosoco: Sure Klean 600 Detergent

**PART 3 - EXECUTION:****3.01 INSTALLATION, GENERAL:**

- A. Wetting Clay Brick: Wet brick made from clay or shale which have ASTM C67 initial rates of absorption (suction) of more than 30 grams per 30 sq.in.per minute. Use wetting methods that ensure each clay masonry unit being nearly saturated but surfaces dry when laid.
- B. Cleaning Reinforcing: Before placing, remove loose rust, ice and other coatings from reinforcing.
- C. Thickness: Build cavity and composite walls, floors and other masonry construction to the full thickness shown, Build single-wythe walls (if any) to the actual thickness of masonry units, using units of normal thickness indicated.
  - 1. Build chases and recesses as shown or required for the work of other trades.
- D. Leave openings for equipment to be installed before completion of masonry work. After installation of equipment, complete masonry work to match work immediately adjacent to the opening.
- E. Cut masonry units using motor-driven saws to provide clean, sharp, unshipped edges. Use full-size units without cutting where possible.

**3.02 CONTROL AND EXPANSION JOINTS:**

- A. General: Provide vertical and horizontal expansion, control and isolation joints in masonry where shown in drawings or per the following:
  - 1. Vertical control joints to be spaced no more than 24'-0" on center.
  - 2. For high humidity areas (average annual relative humidity greater than 75%), vertical control joints to be spaced no more than 18'-0" on center..Build-in related items as the masonry work progresses.

**3.03 FLASHING OF MASONRY WORK:**

- A. General: Provide concealed flashing in masonry work at, or above shelf angles, lintel, ledges and other obstructions. Place through-wall flashing on sloping bed of mortar and cover with mortar. Seal penetrations in flashing with mastic before covering with mortar. Extend flashing through exterior face of masonry and turn down to form drip.
- B. Extend flashing the full length of lintels and shelf angles a minimum of 4" into masonry each end.
- C. Install flashing to comply with manufacturer's instructions.
- D. Provided weep holes in the head joints of the first course of masonry immediately above concealed flashing. Space 24" o.c. unless otherwise indicated.

**3.04 POINTING AND CLEANING:**

- A. Pointing: During the tooling of joints, enlarge any voids or holes, except weep holes, and completely fill with mortar. Point-up all joints including corners, openings and adjacent work to provide a neat, uniform appearance, prepared for application of sealants.
- B. Final Cleaning: After mortar is thoroughly set and cured, clean masonry as follows:
  - 1. Remove large mortar particles by hand with wooden paddles and non-metallic scrape hoes or chisels.



2. Saturate wall surfaces with water prior to application of cleaners: remove cleaners promptly by rinsing thoroughly with clear water.
3. Protection: Provide final protection and maintain conditions in a manner acceptable to Installer, which ensures unit masonry work being without damage and deterioration at time of substantial completion.

END OF SECTION

**Construction Specification****REINFORCED UNIT MASONRY****PART 1 - GENERAL****1.01 SUMMARY**

- A. This Section includes the following:
  - 1. Concrete unit masonry
- B. Related work specified elsewhere includes but may not be limited to:
  - 1. Section 01012 - Preferred Purchasing
  - 2. Section 01411 Testing and Inspection
  - 3. Section 04100 - Mortar and Grout
  - 4. Section 05501 - Metal Fabrications (steel lintels and miscellaneous steel frames)
  - 5. Section 06100 - Rough Carpentry (wood nailers and blocking built into unit masonry)
  - 6. Section 07180 - Water Repellant
  - 7. Section 07901 - Joint Sealers/Fillers (sealants in masonry construction joints)
  - 8. Section 08110 - Hollow Metal Doors and Frames (hollow metal frames in unit masonry openings)

**1.02 PREFERRED PURCHASING**

- A. Unless noted otherwise, Contractor and all subcontractors are encouraged to purchase all products listed in this specification section from a local The Home Depot Store. For more information, refer to Section 01012.

**1.03 SUBMITTALS TO ARCHITECT OF RECORD**

- A. General: Submit product data material certificates signed by manufacturer and contractor certifying that each material complies with requirements for each different masonry unit, accessory, and other manufactured product indicated.
- B. Colored Mortar Mix Design
- C. Grout Mix Design - Each Type
- D. Certificates for Fire-Rated Masonry Units - ASTM C119
- E. Test Certificates for each type of Masonry Unit specified - ASTM C140
- F. Samples: Submit manufacturers color and texture samples to match colors indicated on drawings

**1.04 QUALITY ASSURANCE**

- A. Unit Masonry Standard: Comply with ACI 530.1/ASCE 6 "Specifications for Masonry Structures, " except as modified herein.
- B. Fire performance characteristics: Where indicated, provide materials and construction which are identical to those of assemblies whose fire resistance has been determined per ASTM E 119 by a testing and inspecting organization, by equivalent concrete masonry thickness, or by another means, as acceptable to authorities having jurisdiction.
- C. The Owner will employ and pay for the services of an Independent Testing Contractor (ITC) to provide testing and inspections of the masonry work.
- D. The services of the ITC, and the information provided by the ITC, are provided for the sole benefit of Owner. The information is provided to Contractor only so the Contractor is aware of what is being reported to Owner. The Contractor shall not, and is not entitled to, rely upon any information provided by the ITC in any manner. Contractor is solely responsible for assuring that the Work complies with the Contract Documents in all respects and may not rely on the ITC for this, or any other, assurance. The ITC and its representatives are not authorized to revoke, alter, relax, enlarge or release any requirements of the Contract Documents, approve or accept any portion of the Work, perform or excuse any duties of Contractor, or be a party to the scheduling of the Work. The ITC is not an authorized agent of the Owner with respect to the relationship between Owner and Contractor.
- E. Masonry materials and operations shall be tested and inspected as the work progresses. Failure by the ITC to detect any defective work or material shall not in any way prevent later rejection (when such defect is discovered) nor shall it obligate the Owner for final acceptance.
- F. See Section 01411 Testing and Inspection for a complete description of the services to be performed by the ITC and additional Contractor responsibilities to facilitate that work.

**1.05 DELIVERY, STORAGE AND HANDLING**

- A. Deliver masonry materials to project in undamaged condition.
- B. Store and handle masonry units off the ground, under cover, and in a dry location to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion, and other causes. If units become wet, do not place until units are

**Construction Specification****REINFORCED UNIT MASONRY**

in an air-dried condition.

- C. Store cementitious materials off the ground, under cover and in a dry location.
- D. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- E. Store masonry accessories including metal items to prevent corrosion and accumulation of dirt and oil.

**PART 2 - PRODUCTS****2.01 CONCRETE MASONRY UNITS**

- A. Provide special shapes where indicated for lintels, corners, jambs, sash, control joints, headers, bonding, and other special conditions. Provide square-edged units for outside corners.
- B. Size: Comply with ASTM specifications for concrete masonry units.
  - 1. Concrete Masonry Units: Manufactured to specified dimensions of 3/8 inch less than nominal widths by nominal heights by nominal lengths indicated on drawings. Nominal Face Dimensions: 8" X 16" for full size units.
- C. Exposed Faces (Exterior and Interior Masonry): Manufacturer's standard gray color and smooth face texture, unless otherwise indicated.
- D. Exposed Faces (All Exterior Above-Grade Masonry): Manufacturers' integrally colored, split-face texture, unless otherwise indicated. The manufacturer and colors indicated on the drawings are listed for color and texture only. Other masonry manufacturers meeting the above criteria will be considered as comparable products. Samples are to be submitted to Owner 15 days prior to bid due date for consideration.
- E. Custom Units:
  - 1. Refer to drawings for color and location of integrally colored units (i.e., white, brown, gray, beige, etc.).
  - 2. Refer to drawings for type and location of architectural or customized units (i.e., smooth, split-face, fluted, scored, ribbed, slump, etc.)
  - 3. Where indicated, provide units called out by manufacturer and catalog number or approved equal.
- F. Hollow Load-Bearing Concrete Masonry Units: ASTM C 90, and as follows:
  - 1. Unit Compressive Strength: 1900 psi minimum average compressive strength.
  - 2. Weight Classification: Normal weight.
  - 3. Aggregate: ASTM C33.
- G. Concrete Building Brick: ASTM C55 and as follows:
  - 1. Unit Compressive Strength: 3500 psi
  - 2. Weight Classification: Normal Weight
  - 3. Grade N, Type I
  - 4. Air cured or steam cured. Curing by Autoclave method not allowed.
- H. Single-Source Responsibility for Masonry Units: Obtain exposed masonry units of uniform texture, or a uniform blend within the ranges accepted for these characteristics, from one manufacturer for each different product required for each continuous surface or visually related surfaces.
- I. Single-Source Responsibility for Mortar Materials: Obtain mortar ingredients of uniform quality, from one manufacturer for each cementitious component and from one source and producer for each aggregate.

**2.02 WATER-REPELLENT**

- A. Refer to Section 07180

**2.03 MORTAR AND GROUT MATERIALS**

- A. Refer to Section 04100

**2.04 REINFORCING STEEL**

- A. Steel Reinforcing Bars: Material and grade as follows:
  - 1. Billet steel complying with ASTM A 615, Grade 60, deformed, unless noted otherwise.

**2.05 JOINT REINFORCEMENT**

- A. General: Provide joint reinforcement complying with requirements of referenced unit masonry standard and this article, formed

**Construction Specification****REINFORCED UNIT MASONRY**

from the following:

1. Carbon steel wire, galvanized to conform to ASTM A153-B2.
- B. Description: Welded-wire units prefabricated with deformed continuous side rods and plain cross rods into straight lengths of not less than 10 feet, with prefabricated corner and tee units, and complying with requirements indicated below:
  1. Wire Diameter for Side Rods: 0.1483 inch (9 gage).
  2. Wire Diameter for Cross Rods: 0.1483 inch (9 gage).
  3. For single-wythe masonry provided type as follows with single pair of side rods:
    - a. Truss design with continuous diagonal cross rods spaced not more than 16 inches o.c.
    - b. Ladder design with two or more parallel longitudinal rods weld connected to perpendicular cross rods spaced not more than 16" o.c.
- C. Manufacturers: Subject to compliance with requirements, provide joint reinforcement by one of the following:
  1. Dur-O-Wal, Inc.
  2. Heckman Building Products, Inc.
  3. Hohmann & Barnard, Inc.

**2.06 TIES AND ANCHORS, GENERAL**

- A. General: Provide ties and anchors specified in subsequent articles that comply with requirements for metal and size of reference unit masonry standard and of this article.
- B. Galvanized Carbon Steel Wire: ASTM A 82, coating class as required by referenced unit masonry standard for application indicated.
  1. Wire Diameter: 0.1875 inch.
- C. Steel Plates and Bars: ASTM A 36, hot-dip galvanized to comply with ASTM A 123 or ASTM A 153, Class B3, as applicable to size and form indicated.
- D. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  1. Dur-O-Wal, Inc.
  2. Heckman Building Products, Inc.
  3. Hohmann & Barnard, Inc.

**2.07 ADJUSTABLE ANCHORS FOR CONNECTING MASONRY TO STRUCTURAL FRAMEWORK**

- A. General: Two-piece assemblies as described below allowing vertical or horizontal differential movement between wall and framework parallel to plane of wall, but resisting tension and compression forces perpendicular to it. Provide only when indicated on drawings.

**2.08 RIGID ANCHORS**

- A. Provide straps of form and length indicated, fabricated from metal strips of the following width and thickness.
  1. 1-1/2 inches wide by 1/4 inch thick

**2.09 ANCHOR BOLTS**

- A. Anchor Bolts: Steel bolts complying with A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A 153, Class C; of diameter and length indicated.

**2.10 MISCELLANEOUS MASONRY ACCESSORIES**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  1. Dur-O-Wal, Inc.
  2. Heckman Building Products, Inc.
  3. Hohmann & Barnard, Inc.
- B. Preformed Control Joint Gaskets: Material as indicated below; designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
  1. Slot Seal Standard T015-3, Styrene-Butadiene Rubber Compound: ASTM D 2000, Designation 2AA-805.
- C. Bond Breaker Strips: Asphalt-saturated organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).
- D. Weep Holes: Provide the following:

**Construction Specification****REINFORCED UNIT MASONRY**

1. Through masonry only: 1/4" sash cords, length to coordinate with thickness of wythe; or Weep vents (color to match mortar).
2. Tubing not permitted.

## E. Joint Protection Board: Provide the following:

1. Closed Cell Expanded Polyethylene foam complying with ASTM D3575 - Tests AA, BB, B, C, D, E, F and ASTM D-790.
2. Size: 1" thick X 2'-0" wide X ±4'-0".
3. Color: White.
4. Adhesive: As recommended by Manufacturer.
5. Acceptable Products:
  - a. Williams Products, Inc.: Expand-O-Foam 1380 Series.

**2.11 EMBEDDED FLASHING MATERIALS**

## A. Copper-Fabric Laminated Flashing: Manufacturer's standard laminated flashing of type indicated below:

1. Copper sheet of weight per sq. ft. indicated below, bonded with asphalt between 2 layers of glass fiber cloth.
2. Weight: 3 oz.
3. Application: Use where flashing is fully concealed in masonry.
4. Acceptable Products:
  - a. Afco Products Inc.: Copper Fabric
  - b. Sandell Manufacturing Co., Inc.: Copper Fabric Flashing
  - c. York Manufacturing, Inc.: Copper Fabric Flashing

## B. Adhesive for Flashings: Of type recommended by manufacturer of flashing material for use indicated.

**2.12 MASONRY CLEANERS**

## A. Acceptable Products:

1. Prosoco Inc.: Sure Klean Burnished Custom Masonry Cleaner
2. or approved equal when expressly approved for intended use by manufacturer of masonry units and mortars being cleaned.

**2.13 MASONRY INSULATION**

## A. Masonry Cell Insulation: expanded polystyrene insulation inserts for standard two core masonry units. Provide 2" thick EPS insert in 12" wide masonry units, to be factory installed at the exterior wall face of all cells. Use original "horseshoe" insert in all 8" wide masonry units. Furnish insulation in all cells except bond beams, lintels and parapets above the roofline, and where otherwise indicated to be deleted.

## B. Acceptable Products:

1. CBIS/Korfil: Korfil
2. Insul-Bloc Corp.: Insul-Bloc
3. No substitutions

**PART 3 - EXECUTION****3.01 PROJECT CONDITIONS**

## A. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Remove immediately any grout, mortar and soil those come in contact with such masonry.

1. Protect base of walls from mortar splatter by means of covering spread over wall surface.
2. Protect sills, ledges, and projections from mortar droppings.
3. Protect surfaces of window and doorframes, as well as similar products with painted and integral finishes from mortar droppings.

## B. Hot-Weather Construction: Comply with reference unit masonry standard.

## C. Cold Weather Requirements:

1. Comply with IMIAC - Recommended Practices and Guides Specifications for Cold Weather Masonry Construction.
2. When the ambient air temperature is below 40 degrees F, heat-mixing water to maintain mortar temperature between 40 degrees F until placed. When the ambient air temperature is below 32 degrees F, heat the water to maintain this mortar temperature.

**3.02 EXAMINATION**

**Construction Specification****REINFORCED UNIT MASONRY**

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other specific conditions, and other conditions effecting performance of unit masonry.
- B. Examine rough-in and built-in construction to verify actual locations of piping connections prior to installation.
- C. Do not proceed until unsatisfactory conditions have been corrected.

**3.03 INSTALLATION, GENERAL**

- A. Comply with referenced unit masonry standard and other requirements indicated applicable to each type of installation included in Project.
- B. Thickness: Build single-wythe wall to the actual thickness of the masonry units, using units of nominal thickness indicated.
- C. Build chases and recesses as shown or required to accommodate items specified in this and other Sections of Specifications. Provide not less than 8 inches of masonry between chase or recess and jamb of openings and between adjacent chases and recesses.
- D. Leave openings for equipment to be installed before completion of masonry. After installation of equipment, complete masonry to match construction immediately adjacent to the opening.
- E. Cut masonry units with motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide continuous pattern and to fit adjoining construction. Use full-size units without cutting where possible.
  - 1. At grouting clean-out locations, use face shell plugs adequately braced to resist grout pressure.

**3.04 CONSTRUCTION TOLERANCES**

- A. Variation from Plumb: For vertical lines and surfaces of columns, walls, and arises, do not exceed 1/4 inch in 10 feet (6 mm in 3 m), nor 3/8 inch in 20 feet (10 mm in 6 m), nor 1/2 inch in 40 feet (12 mm in 12 m or more). For external corners, expansion joints, control joints, and other conspicuous lines, do not exceed 1/4 inch in 20 feet (6 mm or in 6 m), nor 1/2 inch in 40 feet (12 mm in 12 m) or more. For vertical alignment of head joints, do not exceed plus or minus 1/4 inch in 10 feet (6 mm in 3 m), nor 1/2 inch (12 mm) maximum.
- B. Variation from Level: For bed joints and lines of exposed lintels, sills, parapets, horizontal grooves, and other conspicuous lines, do not exceed 1/4 inch in 20 feet (6 mm in 6 m), nor 1/2 inch in 40 feet (12 mm in 12 m) or more. For top surface of bearing walls, do not exceed 1/8 inch (3 mm) in 10 feet (3 m), nor 1/16 inch (1.5 mm) within width of a single unit.
- C. Variation of Linear Building Line: For position shown in plan and related portion of columns, walls and partitions, do not exceed 1/2 inch in 20 feet (12 mm in 6 m), nor 3/4 inch in 40 feet (19 mm in 12 m) or more.
- D. Variation in Cross-Sectional Dimensions: For column and thickness of walls, from dimensions shown, do not exceed minus 1/4 inch (6 mm) nor plus 1/2 inch (12 mm).
- E. Variation in Mortar-Joint Thickness: Do not vary from bed-joint thickness indicated by more than plus or minus 1/8 inch (3 mm) with a maximum thickness limited to 1/2 inch (12 mm). Do not vary bed-joint thickness from bed-joint thickness of adjacent course by more than 1/8 inch (3 mm). Do not vary from head-joint thickness indicated by more than plus or minus 1/8 inch (3 mm). Do not vary head-joint thickness from adjacent head-joint thickness by more than 1/8 inch (3 mm). Do not vary from collar-joint thickness indicated by more than minus 1/4 inch (6 mm) or plus 3/8 inch (10 mm).

**3.05 LAYING MASONRY WALLS**

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint widths and for accurate locating of openings, movement-type joints, returns, and offsets. Avoid the use of less-than-half-size units at corners, jambs, and where possible at other locations.
- B. Lay up walls to comply with specified construction tolerances, with courses accurately spaced and coordinated with other construction.
- C. Bond Pattern for Exposed Masonry: Lay exposed masonry in the following bond pattern; do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.
  - 1. Running bond with vertical joint in each course centered on units in courses above and below unless otherwise indicated.
- D. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 2 inches. Bond and interlock each course of each wythe at corners. Do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.
- E. Stopping and Resuming Work: In each course, rack back 1/2"-unit length for one-half running bond; do not tooth. Clean exposed surfaces of set masonry, and remove loose masonry units and mortar prior to laying fresh masonry.
- F. Built-In-Work: As construction progresses, build-in-items specified under this and other Sections of the Specifications. Fill in

**Construction Specification****REINFORCED UNIT MASONRY**

solidly with masonry around built-in-items.

1. Fill space between hollow metal frames and masonry solidly with mortar, unless otherwise indicated.
2. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath in the joint below and rod mortar or grout into core.
3. Fill cores in hollow concrete masonry units with grout 3 courses (24 inches) under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated.

G. Temporarily brace walls to provide stability during construction.

H. Temporarily shore masonry to provide support during construction.

**3.06 MORTAR BEDDING AND JOINTING**

A. Lay hollow concrete masonry units as follows:

1. With full mortar coverage on horizontal and vertical face shells.
2. Bed webs in mortar in starting course on footings and in all courses of piers, columns, and pilasters, and where adjacent to cells or cavities to be filled with grout.
3. For starting course on footings where cells are not grouted, spread out full mortar bed including areas under cells.

B. Joint Tooling: Tool all exposed joints slightly concave ("U" grooved joints) unless otherwise indicated.

1. Flush Joints: Joints in masonry to receive finish work of trades other than painting shall be struck flush.

**3.07 HORIZONTAL JOINT REINFORCEMENT**

A. General: Provide continuous horizontal joint reinforcement as indicated. Install longitudinal side rods in mortar for their entire length with a minimum cover of 5/8 inch. Lap reinforcing a minimum of 6 inches.

B. Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.

C. Provide continuity at corners and wall intersections by use of prefabricated "L" and "T" sections. Cut and bend reinforcement units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

D. Reinforce masonry openings greater than 1'-0" wide, with horizontal joint reinforcement placed in 2 horizontal joints approximately 8" apart, immediately above the lintel and immediately below the sill. Extend reinforcement a minimum of 2'-0" beyond jambs of the opening except at control joints.

1. In addition to wall reinforcement, provide additional reinforcement at openings as required to comply with the above.

**3.08 MOVEMENT (CONTROL AND EXPANSION) JOINTS**

A. General: Install control and expansion joints in unit masonry as enumerated below and where indicated on drawings. Build in related items as the masonry progresses. Do not form a continuous span through movement joints unless provisions are made to prevent in-plane restraint of wall or partition movement.

B. Place control joints in the following locations:

1. Vertical control joint spacing as shown on drawings or as follows:
  - a. Vertical control joints to be spaced no more than 24'-0" on center.
  - b. For high humidity areas (average annual relative humidity greater than 75%), vertical control joints to be spaced no more than 18'-0" on center.
2. Changes in wall height or thickness.
3. At construction joints in foundation, in roof, and in floors (where CMU bears on floor slab).
4. At chases and recesses for piping, columns, fixtures, etc.
5. At abutment of wall and columns.
6. At return angles in "L", "T" and "U" shaped structures.
7. At one or both sides of wall openings.
  - a. Place control joint at one side of an opening less than six feet in width and at both jambs of openings over six feet wide. Extend control joint through wall finishes where applied directly to masonry units.
  - b. Provide horizontal slip plane where reinforced lintel beam terminates at a control joint. Provide horizontal slip plane at junction of roof and load-bearing masonry terminating at a control joint. Bond between roof and wall should be broken 12-15 feet back from corners, with slip plane.

C. Form control joints in concrete masonry as follows:

1. Install special shapes designed for control joints. Install bond breaker strips at joint. Keep head joints free and clear of mortar or rake joint. Fill joints with elastomeric sealant; refer to Section 07901, "Joint Sealers."

D. Form building expansion joints in concrete masonry as follows.

**Construction Specification****REINFORCED UNIT MASONRY**

1. Install special shapes designed for building expansion joint. Use primer from top of footing to 1'-0" above grade line. Silicone sealant shall meet requirements of Section 07901, Joint Sealants.
2. Material is compressed and recessed 1/4" into joint opening. A wet silicone sealant is caulked into reveals. Clean all joints prior to installing seal from loose particles, dust, foreign matter, grease, frost, water, etc.
3. Install according to manufacturer's instruction sheets and recommendations.
4. Caulking Wet Silicone Sealant: Caulk 6' sections independently. Caulk across the reveal at the head joint, then caulk down reveals on both sides of cured sealant and substrate. Tool the wet sealant.
5. Install protection board with the 2'-0" wide face centered on the expansion joint, apply adhesive on board to one side of foundation wall joint with adhesive recommended by manufacturer. Extent of protection board shall be from top of footing to 4" below grade line.

**3.09 BOND BEAMS**

- A. Install horizontal reinforcing steel continuous through control joints.
- B. Horizontal reinforcing steel shall not run continuous through building expansion joints.

**3.10 LINTELS**

- A. Install loose steel lintels where indicated.
- B. Provide masonry lintels where shown and wherever openings of more than 2'-0" for block size units are shown without structural steel or other supporting lintels. Provide formed-in-place masonry lintels. Cure precast lintels before handling and installation. Temporarily support formed-in-place lintels.
  1. For hollow concrete masonry unit walls, use specially formed bond beam units with reinforcement bars placed as indicated and filled with coarse grout.
  2. Install pre-engineered precast concrete lintels where indicated and where concrete masonry will be concealed by other work.
  3. Provide minimum bearing of 8 inches at each jamb, unless otherwise indicated.
- C. Install miscellaneous steel frames where indicated.

**3.11 FLASHING/WEEP HOLES**

- A. General: Install embedded flashing and weep holes in masonry at shelf angles; lintels, ledges, other obstructions to the downward flow of water in the wall, and where indicated.
- B. Prepare masonry surfaces so that they are smooth and free from projections that could puncture flashing. Place through-wall flashing on sloping bed of mortar and cover with mortar. Seal penetration in flashing with adhesive/sealant/tape as recommended by flashing manufacturer before covering with mortar.
- C. Install flashings as follows:
  1. Extend flashing from exterior face of outer wythe of masonry through the outer wythe, turned up a minimum of 4" and inserted 3/4" into the outer face shell of inner wythe. Do not extend flashing full depth of inner wythe. Installation into inner wythe may be accomplished by raking out horizontal joint, inserting flashing and sealing joint with sealant and backer rod.
  2. At heads and sills, extend flashing as specified above unless otherwise indicated but turn up ends not less than 2 inches to form a pan.
  3. Cut off flashing flush with face of wall after masonry wall construction is completed.
- D. Install weep holes in the head joints in exterior wythes of the first course of masonry immediately above embedded flashings. Space weep holes 36 inches o.c.

**3.12 INSTALLATION OF REINFORCED UNIT MASONRY**

- A. General: Install reinforced unit masonry to comply with requirements of referenced unit masonry standard.
- B. Temporary Formwork: Construct formwork and shores to support reinforced masonry elements during construction.
  1. Construct formwork to conform to shape, line, and dimensions shown. Make sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
- C. Do not place grout until entire height of masonry to be grouted has attained sufficient strength to resist grout pressure.
- D. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other temporary loads that may be placed on them during construction.
- E. Provide cleanout holes at least 3 inches (76 mm) in least dimension for grout pours over 60 inches (1524 mm) in height.



**Construction Specification****REINFORCED UNIT MASONRY**

1. Provide cleanout holes at each vertical reinforcing bar.
2. At solid grouted masonry, provide cleanout holes at not more than 32 inches (813 mm) o.c.

**3.13 REPAIRING AND POINTING**

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or if units do not match adjoining units. Install new units to match adjoining units and in fresh mortar or grout, point to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge any voids or holes, and completely fill with mortar. Point-up all joints including corners, openings, and adjacent construction to provide a neat, uniform appearance, prepared for application of sealants.

**3.14 CLEANING**

- A. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
  1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
  2. Protect adjacent non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
  3. Wet wall surfaces with water prior to application of cleaners; remove cleaners promptly by rinsing thoroughly with clear water.
  4. Clean concrete masonry by means of cleaning method indicated in NCMA TEK 45 applicable to type of stain present on exposed surfaces.
  5. Test cleaning methods on sample wall area; leave ½ area uncleaned for comparison purposes. Obtain project managers approval of sample cleaning before proceeding with cleaning of masonry.
- B. Protection: Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure unit masonry is without damage and deterioration at time of Substantial Completion.

**3.15 FIELD QUALITY CONTROL**

- A. The Owner will engage and pay for the services of an independent testing agency to perform the following testing for field quality control. Payment for these services will be made from the Inspection and Testing Allowance, as authorized by Change Orders. Retesting of materials failing to meet specified requirements shall be done at Contractor's expense.
- B. Testing Frequency: Tests and Evaluations listed in this Article will be performed during construction for each 5,000 sq. ft. (460 sq. m) of wall area or portion thereof, and as otherwise indicated.
- C. Prior to each grouting operation, testing agency shall inspect clean out holes and inspect for rebar positioning and cleanliness of cores. Agency shall have authority to stop grouting operations if the wall has not been properly prepared to comply with ACI Code requirements and proper grouting procedure.
- D. Prism-Test Method: For each type of wall construction indicated, masonry prisms will be tested per ASTM E 447, Method B, and as follows:
  1. Prepare 1 set of prisms for testing at 28 days.
- E. Evaluation of Quality-Control Tests: In the absence of other indications of noncompliance with requirements, masonry will be considered satisfactory if results from construction quality-control tests comply with minimum requirements indicated.

END OF SECTION

**Construction Specification****STRUCTURAL STEEL****PART 1 – GENERAL****1.01 SCOPE OF WORK**

- A. Include all labor, materials and appliances, and perform all operations in connection with the installation of all Structural Steel and all related work, complete, in strict accordance with the drawings, and as specified herein. Structural steel work includes:
1. Design of structural steel connections.
  2. All structural steel including columns, beams, girders, column base and cap plates, joist and beam bearing plates, angles and channels.
  3. Framing for all openings in metal deck.
  4. Connection angles, bolts and electrodes for welding work.
  5. Framing and supports for roof top units.
  6. Steel embed plates, shapes, and anchors to be cast into tilt-up wall panels, retaining walls, or foundations at the project site.
  7. Shop painting.
  8. Shop drawings.
  9. Furnishing of anchor bolts (installation of anchor bolts shall be by the concrete contractor).
  10. Connections for steel joist girders and steel joists to structural steel.
  11. All other items required to make the work of this section complete.
- B. Delivery, Storage and Handling:
1. Store structural steel members at project site above ground on platforms or skids.
  2. Store bolts and weld rods in original containers with labels intact.
  3. Protect items from corrosion affecting structural strength and use.

**1.02 RELATED DOCUMENTS**

- A. Unless otherwise shown or specified, this work shall conform to the following standards:

AISC Code of Standard Practice for Steel Buildings and Bridges (2000)  
 AISC Structural Steel Buildings – Allowable Stress Design, Plastic Design (1989).  
 AISC Load and Resistance Factor Design for Structural Steel Buildings (1993), incl. Supplement No. 1 dated January 1998  
 AISC Specification for the Design of Steel Hollow Structural Sections (1997)  
 AISC Seismic Provisions for Structural Steel Buildings (1997), incl. Supplement No. 1 dated 1999  
 AISC Specification for Structural Joints using ASTM A325 or A490 Bolts  
 AWS (D1.1) Structural Welding Code - Steel

**1.03 SUBMITTALS TO ARCHITECT OF RECORD**

- A. Shop Drawings:
1. Submit shop drawings to the Architect of Record for review prior to fabrication. All drawings and outlines must be checked by the Contractor and bear the initials of the checker prior to submitting for review.
  2. Items requiring field measuring shall have all dimensions verified in the field before fabrication.
  3. Prepare in accordance with applicable standards and specifications listed in this Section.
  4. All structural steel shall be detailed, fabricated and erected in accordance with the AISC Code of Standard Practice, except as modified herein.
  5. Submit shop drawings, including complete details and schedules for fabrication and assembly of structural steel members, procedures and diagrams. Include details of cuts, connections, camber, holes and other pertinent data. Indicate welds by standard AWS symbols and show size, length and type of each weld. Furnish erection drawings referencing erection marks to shop detail drawing numbers. Provide setting drawings, templates and directions for installation of anchor bolts and other anchorages to be installed by others. Type of fasteners shall be clearly shown for all members.

**Construction Specification****STRUCTURAL STEEL**

6. Fabricator's erection drawings and shop details shall clearly show the design loads of the connections designed by the Fabricator.
7. The fabricator's engineer shall be responsible for the design, adequacy and safety of all connections. All shop drawings shall be signed and sealed by the fabricator's engineer with the registered engineer's seal for the state where the structure is located. Engineer's seal may be qualified "For Design of Connections Only".
- B. Connection Design Certification: Submit connection design certification stating that all structural steel connections have been designed in accordance with the drawings, project specifications and AISC specifications. Connection design certification shall be signed and sealed by the fabricator's engineer with the registered engineer's seal for the state where the structure is located.
- C. Connection Design Calculations: Design calculations for all connections designed by the fabricator's engineer shall be submitted only when requested by the Owner's Representative for submittal to the building official or for information. Connection design calculations will not be reviewed by the Architect of Record. All design calculations shall be signed and sealed by the fabricator's engineer with the registered engineer's seal for the state where the structure is located.
- D. Review of submittals is only for review of general conformance with the design concept, including verification of the connection design loads shown on the shop drawings. In no case shall this review relieve the contractor of the responsibility for design, adequacy and safety of all connections, correctness of fit, general or detailed dimensions, quality or quantity of materials, or any other conditions, functions, performance or guarantees required.
- E. Submit to the Architect of Record, certification that the steel used in manufacturing the structural shapes for this project contains a minimum of 90% recycled steel manufactured in the USA.

**1.04 QUALITY ASSURANCE**

- A. The Owner will employ and pay for the services of an Independent Testing Contractor (ITC) to provide testing and inspection of structural steel.
- B. The services of the ITC, and the information provided by the ITC, are provided for the sole benefit of Owner. The information is provided to Contractor only so the Contractor is aware of what is being reported to Owner. Contractor shall not, and is not entitled to, rely upon any information provided by the ITC in any manner. Contractor is solely responsible for assuring that the Work complies with the Contract Documents in all respects and may not rely on the ITC for this, or any other, assurance. The ITC and its representatives are not authorized to revoke, alter, relax, enlarge or release any requirements of the Contract Documents, approve or accept any portion of the Work, perform or excuse any duties of Contractor, or be a party to the scheduling of the Work. The ITC is not an authorized agent of the Owner with respect to the relationship between Owner and Contractor.
- C. Structural steel materials and operations shall be tested and inspected as the work progresses. Failure to detect any defective work or material shall not in any way prevent later rejection (when such defect is discovered) nor shall it obligate the Owner's representative for final acceptance.
- D. See Section 01411 Testing and Inspection for a complete description of the services to be performed by the ITC and additional Contractor responsibilities to facilitate that work.

**PART 2 – PRODUCTS****2.01 MATERIALS**

- A. The following structural shapes shall be manufactured in the USA, containing a minimum of 90% recycled steel.
- B. Steel Channels, Angles, and Plate: ASTM A36,  $F_y = 36$  KSI
- C. Steel Wide Flange: ASTM A992,  $F_y = 50$  KSI
- D. Structural Tubing: ASTM A500, Grade B,  $F_y = 46$  KSI.
- E. Steel Pipe: ASTM A53, Grade B,  $F_y = 35$  KSI.
- F. Bolts: ASTM A325.
- G. Welding Electrodes for Arc Welding: Series E70 conforming to AWS D1.1.
- H. Anchor Bolts: ASTM F1554 typical, unless noted otherwise.
- I. Shop paint: Fabricator's standard gray primer conforming to either SSPC 15 or Federal Specification TT-P-636.
  1. Provide primers that are VOC compliant for building location.

**PART 3 – EXECUTION****3.01 DESIGN OF CONNECTIONS**

- A. Unless otherwise shown or called for on the drawings, all shop connections may be either bolted or welded and all field connections shall be bolted. The fabricator is responsible for the design of all connections. Connections shown on the

**Construction Specification****STRUCTURAL STEEL**

structural drawings are schematic and are only intended to show the relationship of members connected. Connection details indicated on the drawings shall be incorporated into the fabricator's connection design.

- B. Unless noted otherwise, connections shall be designed to support half of the allowable uniform load on the beam, defined in the AISC Beam Tables, or the reaction shown on the drawings, whichever is greater. For connections not covered above, notify Engineer of need for additional information.
- C. Unless noted otherwise, connections shall be designed as "simple framing" connections (unrestrained, free-ended) with the ends of beams and girders connected for shear only, and free to rotate with some inelastic, but self-limiting, deformation of connection parts, under gravity load.
- D. Unless otherwise noted, bolted connection shall be designed as bearing type connections using the values for bearing type connection with threads included in the shear plane. A minimum of two bolts per connection must be used.
- E. All connections shall be designed in accordance with the AISC Manual of Steel Construction, Ninth Edition, Part 4, Connections and the AISC Specification for Structural Steel Buildings.
- F. The fabricator is responsible for verifying the tension capacity of axially loaded members after a section is reduced for boltholes. Member size may be increased or connection plates added as required.

**3.02 FABRICATION**

- A. Shop Fabrication and Assembly: Fabricate and assemble structural assemblies in shop to greatest extent possible. Fabricate items of structural steel in accordance with AISC Specifications and as indicated on final shop drawings. Provide camber in structural members where indicated.
- B. Properly mark and match-mark materials for field assembly. Fabricate for delivery sequence that will expedite erection and minimize field handling of materials.
- C. Structural steel fabricator must coordinate details, provide connections and punch holes for other trades as shown on structural, architectural, electrical and mechanical drawings.
- D. Shop splicing of material will not be permitted unless each individual splice is shown on the shop drawings and is subsequently approved by the Project Manager.
- E. Painting
  - 1. All surfaces of steel to be painted shall be cleaned and primed according to Steel Structures Painting Council Specification SSPC-SP-3 and as hereinafter modified.
  - 2. Paint all structural steel items with one shop coat applied at a rate to produce a minimum dry film thickness of 1.0 mil. Do not shop coat the following:
    - a. Surfaces of embed plates, shapes, and anchors cast into concrete.
    - b. Contact surfaces of welded connections and areas within 2" of field welds except as noted.
    - c. Contact surfaces of high-strength bolted connections.
    - d. Surfaces receiving sprayed-on fireproofing.
    - e. Surfaces receiving field welded steel studs.
  - 3. All steel shall be delivered to the job site free of oil.
- F. Inspection: Fabrication work may be subject to inspection by Owner's Representative and/or an independent testing laboratory. All reasonable facilities shall be made available for the inspectors at all times. Contractor shall bear costs of testing work performed by his field and shop forces necessary to insure performance of contract.

**3.03 ERECTION**

- A. The steel structure is a non-self-supporting steel frame and is dependent upon diaphragm action of the metal roof deck and attachment to the walls for stability and for resistance to wind and seismic forces. Provide all temporary supports required for stability and for resistance to wind and seismic forces until these elements are complete and are capable of providing this support.
- B. Furnish to concrete contractor all required anchor bolts and other incidental items of structural steel required to be built into concrete or masonry. Furnish templates and location plans for installing these items.
- C. Thoroughly examine and check the placement of anchor bolts and any supports on which the structural steel work is in any way dependent and notify the Owner's Representative in writing of any defects that would affect the satisfactory completion of this work. The starting of structural steel erection shall imply acceptance of the underlying surfaces.
- D. Set and shim all base plates to the elevations shown on the contract drawings. Place non-shrink grout below base plates after final leveling.

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**Construction Specification****STRUCTURAL STEEL**

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- E. Use care in handling and erection to insure that steel shall not be twisted, bent or otherwise damaged, and should any difficulty be encountered, it shall immediately be reported to the Owner's Representative. No cutting or modification of structural shapes will be done in the field without the consent of the Owner's Representative.
- F. Furnish all erection equipment, power, planking, bracing, guys, bolts, shims, etc., necessary in executing this part of the work.
- G. Welders shall be certified by an independent testing and inspection service. Tests for uncertified welders shall be at the expense of this contractor.
- H. Misfits, due to shop or drafting errors, will be corrected or replaced in field at the fabricator's expense.
- I. All steel shall be erected square, plumb and true to lines and levels. Any measures required to correct out of plumb steel columns, etc., will be at this contractor's expense.
- J. Field touch up painting shall be done with the same type of paint as the shop coat. Touch up shall include erection damage, cleaning and painting of field connections or welds, bolts, nuts, and areas adjacent to welds not primed.

END OF SECTION

**Construction Specification****(FBO) STEEL JOIST GIRDERS (VULCRAFT)****PART 1 - GENERAL****1.01 SCOPE OF WORK**

- A. The work required under this section consists of all steel joist girders, accessories and related items necessary to complete the work indicated on the drawings and as specified.
- B. The owner has elected to pre-purchase open web steel joist girders for this project. The Owner shall pay all freight associated with delivery of the open web steel joist girders to the jobsite. The joist girder manufacturer will provide bolts that connect two or more of their supplied products together (joists to joist girders, bolted bridging, etc). The Contractor is responsible for providing all other bolts and accessory steel items necessary to complete the work.
- C. Related Work specified elsewhere includes but not limited to:
  - 1. Section 01010 - Furnished By Owner Items (FBO)
  - 2. Section 05120 - Structural Steel
  - 3. Section 05220 - Steel Joists
  - 4. Section 05300 - Steel Deck (if applicable)

**1.02 REFERENCES**

- A. Unless otherwise shown or specified, this work shall conform to the following standards adopted by the Steel Joist Institute:
  - 1. Standard Specifications for Joist Girders, **SJI-JG-2010**
  - 2. Code of Standard Practice for Steel Joists and Joist Girders, **SJI-COSP-2010**
  - 3. Technical Digest No. 9 – "Handling and Erection of Steel Joist and Joist Girders".

**1.03 FBO PROCEDURES**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section. General requirements related to Furnished by Owner (FBO) Items are as defined in Section 01010. All FBO Forms listed below are included as part of Section 01010.
- B. Vendor Contact: Contractor shall send a completed "FBO Form A: Contractor Information Form" to the FBO vendor indicated below, twelve (12) weeks prior to the scheduled installation of the specified system:
 

Nucor-Vulcraft Group  
 Bobby Wesley  
 6230 Shiloh Road; Suite 140  
 Alpharetta, GA 30005  
 Tel: (678) 965-6667  
 Email: [vulcraft.fbo@vulcraft-al.com](mailto:vulcraft.fbo@vulcraft-al.com)
- C. Take-Offs: FBO Vendor shall provide "take-offs" to the Contractor as specified in Section 01010. The Contractor shall then verify this "take-off" using an "FBO Form B: Take Off Confirmation Sheet".
  - 1. This take-off shall define the number of major components (i.e. number of joist girders) and is not required to contain the specific detailed characteristic of each component.
- D. Receipt Of Shipment: Contractor shall verify shipment per the requirements of Section 01010 and complete the "FBO Form C: Confirmation of Shipment" and submit back to the FBO vendor.
- E. Request for Changes: Changes to materials and quantities after receipt of shipment shall be coordinated by the contractor with the FBO vendor per the requirements of Section 01010 using an "FBO Form D: Request For Additional/Replacement Materials".
- F. Return Merchandise Authorization Policy: The Home Depot will add to the contractors' scope of work the responsibility for coordinating (1) customer accommodation return request through the FBO Vendor. Requests shall be submitted using the "FBO Form E: Returned Materials" as specified in Section 01010.

**1.04 SUBMITTALS TO ARCHITECT OF RECORD**

- A. Shop Drawings:
  - 1. The FBO vendor shall submit shop drawings to the Architect of Record for review prior to fabrication. The contractor shall request their own copy of the shop drawings to review from the FBO vendor to ensure compliance with the project drawings. Notify the Architect of Record of any discrepancies.
  - 2. Items requiring field measuring shall have all dimensions verified in the field before fabrication.
  - 3. Furnish detailed drawings and lists showing the mark, number, and location of all joist girders. Show type of paint and all accessories and details as may be required for proper installation of joist girders.
  - 4. Show design loads and location of loads on each joist girder.

**Construction Specification****(FBO) STEEL JOIST GIRDERS (VULCRAFT)**

- B. Manufacturer's Certification: The FBO vendor shall submit a certification letter stating that all steel joists and girders used on this project have been designed and manufactured in accordance with the drawings, project specifications and SJI specifications. Manufacturer's certification shall be signed and sealed by the manufacturer's engineer with the registered engineer's seal for the state where the structure is located.
- C. Design Calculations: Design calculations for all joist girders used on this project shall be submitted only when requested by the Owner's Representative for submittal to the building official or for information. Design calculations will not be reviewed by the Architect of Record. All design calculations shall be signed and sealed by the manufacturer's engineer with the registered engineer's seal for the state where the structure is located.
- D. Review of submittals is only for review of general conformance with the design concept including verification of the design loads shown on the project drawings. In no case shall this review relieve the contractor of the responsibility for verification of general or detailed dimensions, quantity of materials, or any other conditions, functions, performance or guarantees required.

**PART 2 - PRODUCTS****2.01 ACCEPTABLE MANUFACTURERS**

- A. Nucor-Vulcraft Group

**2.02 MATERIALS**

- A. Steel for Joist Girders: Comply with SJI Specifications manufactured in the USA, containing 90% recycled steel.
- B. Bolts
  - 1. Bolts necessary for erection purposes only may be ASTM A307 or as otherwise required by SJI or OSHA.
  - 2. Permanent connection bolts, required where welding is not specified, shall be ASTM A325 bolts, drawn snug tight, unless specified otherwise.
- C. Shop paint: Manufacturer's standard gray primer conforming to either SSPC 15 or Federal Specification TT-P-636.
  - 1. Provide primers that are VOC compliant for building location.

**PART 3 - EXECUTION****3.01 DESIGN**

- A. Steel joist girders shall be designed by the manufacturer. The manufacturer's engineer shall be responsible for the design, adequacy and safety of all steel joist girders. Design shall be in accordance with the Standard Specifications for Joist Girders.
- B. Unless otherwise noted, steel joist girders shall be designed as simply supported primary members with all loads equal in magnitude and evenly spaced along joist girder top chord.
- C. Additional design loads from rooftop equipment or other concentrated loads shown on the drawings shall be considered as collateral loads. These loads shall be considered in the design of the joist girders. Refer to the architectural and mechanical drawings for locations and weights of equipment. Where such loads do not occur at the panel points of the joist girder, auxiliary framing shall be added to the joist girder or the top chord shall be designed for the effects of the load.
- D. Joist girders shall be designed to support the design loads without exceeding a total load deflection of  $L/180$  or a live load deflection of  $L/240$ , unless noted otherwise in drawings.
- E. When net uplift forces due to wind are shown on the drawings, the manufacturer shall design the joist girders for the net uplift provided.

**3.02 FABRICATION**

- A. Steel joist girders shall be fabricated in accordance with the Standard Specifications for Joist Girders.
- B. Provide strutted ends of the bottom chord of sufficient strength and rigidity to restrain the lateral movement of the bottom chord.
- C. Before application of shop coat, clean steel free of all foreign substances. Give all items one (1) shop coat applied at a minimum rate of 1.0 mil dry film thickness. All steel joist girders shall be delivered to the job site free of oil.
- D. Camber all joist girders in accordance with the Standard Specifications for Joist Girders.

**3.03 ERECTION**

- A. Steel joist girders shall be erected in accordance with the Standard Specifications for Joist Girders.
- B. Thoroughly examine the structural steel and other supports on which the steel joist girder work is in any way dependent and notify the Owner's Representative in writing of any defects, which would affect the satisfactory completion of this work. The

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**Construction Specification****(FBO) STEEL JOIST GIRDERS (VULCRAFT)**

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starting of work in connection with steel joist girders shall imply acceptance of the underlying surfaces.

- C. During the construction period, the contractor shall provide means for the adequate distribution of concentrated loads so that the carrying capacity of any joist girder is not exceeded.
- D. Do not field cut or alter joist girders without written approval of fabricator.
- E. No other loads shall be placed on the joist girder until the steel joists bearing on the girder are in place and attached thereto.
- F. Field touch up painting shall be done with the same type of paint as the shop coat. Touch up shall include bare, abraded, welded and rusted areas. Remove all foreign substances prior to touch up painting.

END OF SECTION



**Construction Specification****(FBO) STEEL JOISTS (VULCRAFT)****PART 1 - GENERAL****1.01 SCOPE OF WORK**

- A. The work required under this section consists of all standard open web joists, accessories and related items necessary to complete the work indicated on the drawings and as specified.
- B. The owner has elected to pre-purchase open web steel joists for this project. The Owner shall pay all freight associated with delivery of the open web steel joists to the jobsite. The joist manufacturer will provide bolts that connect two or more of their supplied products together (joists to joist girders, bolted bridging, etc). The Contractor is responsible for providing all other bolts and accessory steel items necessary to complete the work.
- C. Related Work specified elsewhere includes but not limited to:
  - 1. Section 01010 - Furnished By Owner Items (FBO)
  - 2. Section 05120 - Structural Steel
  - 3. Section 05210 - Steel Joist Girders
  - 4. Section 05300 - Steel Deck (if applicable)

**1.02 REFERENCES**

- A. Unless otherwise shown or specified, this work shall conform to the following standards adopted by the Steel Joist Institute:
  - 1. Standard Specifications for Open Web Steel Joists, **K-Series, SJI-K-2010 ; and LH-Series, SJI-LH/DLH-2010**
  - 2. Code of Standard Practice for Steel Joists and Joist Girders, **SJI-COSP-2010**
  - 3. Standard Load Tables - Open Web Steel Joists, K-Series and LH-Series **K-Series, SJI-K-2010 ; and LH-Series, SJI-LH/DLH-2010**
  - 4. Technical Digest No. 9 – “Handling and Erection of Steel Joist and Joist Girders.”

**1.03 FBO PROCEDURES**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section. General requirements related to Furnished by Owner (FBO) Items are as defined in Section 01010. All FBO Forms listed below are included as part of Section 01010.
- B. Vendor Contact: Contractor shall send a completed “FBO Form A: Contractor Information Form” to the FBO vendor indicated below, twelve (12) weeks prior to the scheduled installation of the specified system:
 

Nucor-Vulcraft Group  
Bobby Wesley  
6230 Shiloh Road; Suite 140  
Alpharetta, GA 30005  
Tel: (678) 965-6667  
Email: [vulcraft.fbo@vulcraft-al.com](mailto:vulcraft.fbo@vulcraft-al.com)
- C. Take-Offs: FBO Vendor shall provide “take-offs” to the Contractor as specified in Section 01010. The Contractor shall then verify this “take-off” using an “FBO Form B: Take Off Confirmation Sheet”.
  - 1. This take-off shall define the number of major components (i.e. number of joists) and is not required to contain the specific detailed characteristic of each component.
- D. Receipt Of Shipment: Contractor shall verify shipment per the requirements of Section 01010 and complete the “FBO Form C: Confirmation of Shipment” and submit back to the FBO vendor.
- E. Request for Changes: Changes to materials and quantities after receipt of shipment shall be coordinated by the contractor with the FBO vendor per the requirements of Section 01010 using an “FBO Form D: Request For Additional/Replacement Materials”
- F. Return Merchandise Authorization Policy: The Home Depot will add to the contractors’ scope of work the responsibility for coordinating (1) customer accommodation return request through the FBO Vendor. Requests shall be submitted using the “FBO Form E: Returned Materials” as specified is Section 01010.

**1.04 SUBMITTALS TO ARCHITECT OF RECORD**

- A. Shop Drawings:
  - 1. The FBO vendor shall submit shop drawings to the Architect of Record for review prior to fabrication. The contractor shall request their own copy of the shop drawings to review from the FBO vendor to ensure compliance with the project drawings. Notify the Architect of Record of any discrepancies.
  - 2. Items requiring field measuring shall have all dimensions verified in the field before fabrication.
  - 3. Furnish detailed drawings and lists showing the mark, number, type, location, and spacing of all joists. Show bridging type, mark, method of attachment to the joists and anchorage at the ends. Show type of paint and all accessories and

**Construction Specification****(FBO) STEEL JOISTS (VULCRAFT)**

- details as may be required for proper installation of joists.
4. Show design loads on each joist.
- B. Manufacturer's Certification: The FBO vendor shall submit a certification letter stating that all steel joists and girders used on this project have been designed and manufactured in accordance with the drawings, project specifications and SJI specifications. Manufacturer's certification shall be signed and sealed by the manufacturer's engineer with the registered engineer's seal for the state where the structure is located.
  - C. Design Calculations: Design calculations for all joists used on this project shall be submitted only when requested by the Owner's Representative for submittal to the building official or for information. Design calculations will not be reviewed by the Architect of Record. All design calculations shall be signed and sealed by the manufacturer's engineer with the registered engineer's seal for the state where the structure is located.
  - D. Review of submittals is only for review of general conformance with the design concept including verification of the design loads shown on the project drawings. In no case shall this review relieve the contractor of the responsibility for verification of, general or detailed dimensions, quantity of materials, or any other conditions, functions, performance or guarantees required.

**PART 2 - PRODUCTS****2.01 ACCEPTABLE MANUFACTURERS**

- A. Nucor-Vulcraft Group

**2.02 MATERIALS**

- A. Steel: Manufactured in the USA containing 90% recycled steel, comply with SJI Specifications.
- B. Bridging: Comply with SJI Specifications.
- C. Bolts
  1. Bolts necessary for erection purposes only may be ASTM A307 or as otherwise required by SJI or OSHA.
  2. Permanent connection bolts, required where welding is not specified, shall be ASTM A325 bolts, drawn snug tight, unless specified otherwise.
- D. Shop Paint: Manufacturer's standard gray primer conforming to either SSPC 15 or Federal Specification TT-P-636.
  1. Provide primers that are VOC compliant for building locations.

**PART 3 - EXECUTION****3.01 DESIGN**

- A. Steel joists shall be designed by the manufacturer. The manufacturer's engineer shall be responsible for the design, adequacy and safety of all steel joists. Design shall be in accordance with the Standard Specifications for Open Web Steel Joists, K-Series and/or LH-Series (as indicated on drawings).
- B. Unless otherwise noted, steel joists shall be designed as simply supported, uniformly loaded trusses with the top chord braced against lateral buckling. The uniform design load shall be the total safe uniformly distributed load as shown in the SJI Standard Load Table.
- C. When net uplift forces due to wind are shown on the drawings, the manufacturer shall design the joists; and bridging for the net uplift provided. A single line of bottom chord bridging must be provided near the first bottom chord panel points whenever uplift due to wind forces is shown on the design drawings.
- D. When non-uniform or concentrated loads are shown on the drawings, the manufacturer shall design the joists in accordance with Paragraph 4.1 of the Standard Specification for Open Web Steel Joists, K-Series and/or Paragraph 1.03.1 of the Standard Specification for Open Web Steel Joists, LH-Series.
- E. Joists shall be designed to support the design loads without exceeding a total load deflection of L/180 or a live load deflection of L/240, unless noted otherwise in drawings.

**3.02 FABRICATION**

- A. Steel joists shall be fabricated in accordance with the Standard Specifications for Open Web Steel Joists, K-Series and/or LH Series (as indicated on drawings).
- B. Provide extended ends, special depth ends, etc., where indicated on the drawings and as job conditions require.
- C. Before application of shop coat, clean steel free of all foreign substances. Give all steel items one (1) shop coat applied at a minimum rate of 1.0 mil dry film thickness. All steel joists shall be delivered to the job site free of oil.

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**Construction Specification****(FBO) STEEL JOISTS (VULCRAFT)**

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- D. Camber all steel joists for roofs in accordance with the Standard Specifications for Open Web Steel Joists, K-Series and/or LH-Series.

**3.03 ERECTION**

- A. Steel joists shall be erected in accordance with the Standard Specifications for Open Web Steel Joists, K-Series and/or
- B. Thoroughly examine the structural steel and other supports on which the steel joist work is in any way dependent and notify the Owner's Representative in writing of any defects, which would affect the satisfactory completion of this work. The starting of work in connection with open web steel joists shall imply acceptance of the underlying surfaces.
- C. During the construction period, the contractor shall provide means for the adequate distribution of concentrated loads so that the carrying capacity of any joist is not exceeded.
- D. Do not field cut or alter joists without written approval of fabricator.
- E. All bridging and bridging anchors shall be placed and joist ends fixed prior to the application of any loads.
- F. Field touch up painting shall be done with the same type of paint as the shop coat. Touch up shall include bare, abraded, welded and rusted areas. Remove all foreign substances prior to touch up painting.

END OF SECTION

**Construction Specification****(FBO) STEEL DECK (VULCRAFT)****PART 1 - GENERAL****1.01 SCOPE OF WORK**

- A. Include all labor, material and equipment to furnish and install steel decking in accordance with the drawings and as specified.
- B. The owner has elected to pre-purchase steel deck for this project. This does not include metal roof panels specified elsewhere. Owner shall pay all freight associated with delivery of the steel deck to the jobsite. Contractor shall be required to purchase all necessary items as listed below to erect steel deck.
- C. The Contractor shall furnish and install all perimeter filler strips, closures, fasteners and accessories as required, to complete the steel deck work and make it ready to receive roofing or other finish materials.
- D. The Contractor shall contact the Owner's manufacturer to coordinate steel deck delivery. The Contractor shall also contact the Owner's manufacturer to obtain reviewed shop drawings and/or final erection plans.
- E. Related Work specified elsewhere includes but not limited to:
  - 1. Section 01010 - Furnished By Owner Items (FBO)
  - 2. Section 05120 - Structural Steel
  - 3. Section 05210 - Steel Joist Girders
  - 4. Section 05220 - Steel Joists

**1.02 REFERENCES**

- A. Unless otherwise shown or specified, this work shall conform to the following standards.

- 1. SDI Roof Deck Design Manual (2013).
- 2. SDI Diaphragm Design Manual, 4th Edition (2015).
- 3. AWS (D1.3) Structural Welding Code - Sheet Steel (2008).

**1.03 FBO PROCEDURES**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section. General requirements related to Furnished by Owner (FBO) Items are as defined in Section 01010. All FBO Forms listed below are included as part of Section 01010.
- B. Vendor Contact: Contractor shall send a completed "FBO Form A: Contractor Information Form" to the FBO vendor indicated below, twelve (12) weeks prior to the scheduled installation of the specified system:
 

Nucor-Vulcraft Group  
 Bobby Wesley  
 6230 Shiloh Road; Suite 140  
 Alpharetta, GA 30005  
 Tel: (678) 965-6667  
 Email: [vulcraft.fbo@vulcraft-al.com](mailto:vulcraft.fbo@vulcraft-al.com)
- C. Take-Offs: FBO Vendor shall provide "take-offs" to the Contractor as specified in Section 01010. The Contractor shall then verify this "take-off" using an "FBO Form B: Take Off Confirmation Sheet".
  - 1. This take-off shall define the number of major components (i.e. total square footage of deck) and is not required to contain the specific detailed characteristic of each component.
- D. Receipt Of Shipment: Contractor shall verify shipment per the requirements of Section 01010 and complete the "FBO Form C: Confirmation of Shipment" and submit back to the FBO vendor.
- E. Request for Changes: Changes to materials and quantities after receipt of shipment shall be coordinated by the contractor with the FBO vendor per the requirements of Section 01010 using an "FBO Form D: Request For Additional/Replacement Materials".
- F. Return Merchandise Authorization Policy: The Home Depot will add to the contractors' scope of work the responsibility for coordinating (1) customer accommodation return request through the FBO Vendor. Requests shall be submitted using the "FBO Form E: Returned Materials" as specified in Section 01010.

**1.04 SUBMITTALS TO ARCHITECT OF RECORD**

- A. Shop Drawings
  - 1. Submit shop drawings to the Architect of Record for review prior to fabrication. The contractor shall request their own copy of the shop drawings to review from the FBO vendor, to ensure compliance with the project drawings. Notify the Architect of Record of any discrepancies.
  - 2. Items requiring field measuring shall have all dimensions verified in the field before fabrication.

**Construction Specification****(FBO) STEEL DECK (VULCRAFT)**

3. Furnish detailed drawings and lists showing the mark, number, type, and location of all steel deck. Show weld size and attachment pattern to the supporting structure. Show deck side lap fastener type, size and spacing. Show all openings for hatches, stacks, etc. Show type of paint and all accessories and details as may be required for proper installation of steel deck.
- B. Deck Manufacturer's Certification: The Manufacturer shall submit certification that all steel deck used on this project has been manufactured in accordance with the drawings, project specifications and SDI specifications.
- C. Mechanical Fastener Layout and Design Data for Steel Deck (By General Contractor)
  1. Provide a plan with dimensions for the proposed fastener zones of the steel deck diaphragm.
    - a. The proposed zone layout may vary from the zone layout for the welded deck diaphragm provided on the structural drawings. The diaphragm collector elements shall be the same as indicated on the structural drawings.
    - b. The fastener designations and attachment pattern for all fasteners shall be provided for each zone and collector element. Include fasteners for attachment to framing elements and attachment of the deck side laps. Identify different fasteners and attachment patterns if needed at deck end laps or at the perimeter of deck openings.
    - c. The mechanically fastened steel deck diaphragm shall have a strength and stiffness that meets or exceeds the strength and stiffness of the welded steel deck diaphragm shown on the structural drawings. The strength and stiffness shall be substantiated by a building code approved evaluation report. Provide or reference supporting documentation.
    - d. The uplift capacity of the proposed, mechanically fastened steel roof deck shall meet or exceed the components and cladding uplift pressures identified on the structural drawings. The uplift capacity shall be substantiated by a code approved evaluation report. Provide or reference supporting documentation.
  2. Provide fastener identification information
    - a. Inspectors must identify fasteners with different designations easily after installation. Indicate the color coding or visible markings that will aid inspectors in fastener identification.
  3. General Contractor to forward a copy of the submittal that has been approved by the A/E to the Building Official who reviewed the permit drawings.
- D. Review of submittals is only for review of general conformance with the design concept. In no case shall this review relieve the contractor of the responsibility for design, general or detailed dimensions, quality or quantity of materials, or any other conditions, functions, performance or guarantees required.
- E. All shop drawings and details shall be checked by the Contractor to verify existing conditions and coordination with all other trades.

**PART 2 - PRODUCTS****2.01 ACCEPTABLE DECK MANUFACTURERS**

- A. Nucor-Vulcraft Group
- B. The Contractor shall verify the manufacturer that is contracted to supply steel deck with the Owner.

**2.02 DECK MATERIALS**

- A. Steel: Manufactured in the USA, containing a minimum of 65% recycled steel, comply with SDI Specifications. Provide a minimum yield strength of  $F_y = 33,000$  psi unless otherwise specified on the structural drawings.
- B. Accessories: Not provided by FBO vendor. Contractor must provide all accessory items needed for complete installation.
- C. Finish
  1. Steel Roof Deck – Prime painted with manufacturer's standard VOC compliant primer for building location: color grey with flat finish
  2. Composite steel deck for floors or mezzanines (if used) – galvanized ASTM A653 G60.
- D. All deck shall be delivered to the jobsite free of oil.

**2.03 MECHANICAL FASTENERS FOR STEEL DECK (By General Contractor)**

- A. Screws, Pneumatically set pins, or Powder-actuated set pins may be used with the A/E's approval of the required submittals. Quality control procedures shall be strictly followed.
- B. Acceptable manufacturer's
  1. Any that has the building code approved evaluation report to substantiate the fastener's development of the diaphragm shears reported on the structural drawings for the steel deck specified.

**PART 3 - EXECUTION**

**Construction Specification****(FBO) STEEL DECK (VULCRAFT)****3.01 PRE-INSTALLATION MEETING****A. Welded Deck**

1. General Contractor to schedule meeting with installation crews, welders and Owner's ITC.
  - a. Review deck fastening zones, verify welder certifications, verify welders can make the necessary welds to the satisfaction of the Owner's ITC.

**B. Mechanically Fastened Deck (When Used)**

1. General Contractor to schedule meeting with installation crews, Owner's ITC, and Mechanical Fastener Manufacturer's Representative.
  - a. Review Mechanical Fastener Layout and Design Data that has been approved by the A/E.
  - b. Review installation procedures and quality assurance requirements.
    - i. Mechanical Fastener Manufacturer's Representative must demonstrate how to recognize properly installed fasteners as well as improperly installed fasteners.
  - c. Review installation equipment for conformance to the Mechanical Fastener Manufacturer's Requirements.

**3.02 INSTALLATION**

- A. Steel deck shall be erected and fastened in accordance with the SDI Specifications and the deck manufacturer's specifications and erection layouts. If mechanical fasteners are used, follow the Mechanical Fastener Layout that has been approved by the A/E.
- B. Steel deck shall be continuous over at least three spans. Cutting openings through the deck, which are less than 16 square feet in area and all skew cutting, shall be performed in the field.
- C. Lay out deck with end laps centered over supports. Lap ends 2" minimum.
- D. Top and bottom faces and edges of deck materials where cuts have been made shall have prime coating touched-up with a heavy coat of same material as used in shop.
- E. Top surfaces and exposed bottom surfaces where welds have been made shall receive a heavy touch-up coat of primer paint, the same type as used in the shop.
- F. Do not hang or support any loads from steel deck.
- G. Damage:
  1. Vendor shall replace deck damaged, dented or chipped during shipping at no additional cost to Home Depot. Any damage must be noted on the delivery ticket.
  2. All deck damaged, dented or chipped during unloading or erection shall be replaced by Contractor at no additional cost to Home Depot.

END OF SECTION

**Construction Specification****COLD FORMED METAL FRAMING****PART 1 - GENERAL****1.01 SUMMARY**

- A. Types of cold-formed metal framing units include the following:
  - 1. C-shaped steel studs
- B. Related work specified elsewhere includes but may not be limited to:
  - 1. Section 01012: Preferred Purchasing
  - 2. Section 06100: Rough Carpentry for plywood sheathing
  - 3. Section 09260: Gypsum Drywall for Gypsum board

**1.02 PREFERRED PURCHASING**

- A. Unless noted otherwise, Contractor and all subcontractors are encouraged to purchase all products listed in this specification section from a local The Home Depot Store. For more information, refer to Section 01012.

**1.03 REFERENCES**

- A. Unless otherwise shown or specified, this work shall conform to the following standards:
  - 1. ASTM A780-01 - Standard Practice for Repair of Damaged and Uncoated areas of Hot-Dip Galvanized Coatings.
  - 2. ASTM A1003/A1003M-05 - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members.
  - 3. ASTM B633-07 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel.
  - 4. ASTM C645-07 - Standard Specification for Nonstructural Steel Framing Members.
  - 5. ASTM C754-04 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
  - 6. ASTM C955-06 - Standard Specification for Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Panel Products and Metal Plaster Bases.
  - 7. ASTM C1007-04 - Standard Specification for Load-Bearing (Transverse and Axial) Steel Studs and Related Accessories
  - 8. ASTM C1513-04 - Standard Specification for Steel Tapping Screws for Cold-Formed Steel Framing Connections.
  - 9. AISI Specification for the Design of Cold-Formed Structural Members; 2002.
  - 10. AISI - Standard for Cold-Formed Steel Framing General Provisions

**1.04 SUBMITTALS TO CONTRACTOR**

- A. Product Data: Manufacturer's data sheets on each product specified, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation methods.

**1.05 QUALITY ASSURANCE**

- A. Installer Qualifications: Installer experienced in performing work of this section who has specialized in installation of work similar to that required for this project.
- B. Component Design: Calculate structural properties of studs and joists in accordance with American Iron and Steel Institute (AISI) "Specification for Design of Cold-Formed Steel Structural Members."
- C. Welding: Use qualified welders and comply with American Welding Society (AWS) D1.3, "Structural Welding Code - Sheet Steel."
- D. Fire-Rated Assemblies: Where framing units are components of assemblies indicated for a fire-resistance rating, including those required for compliance with governing regulations, provide units that have been approved by governing authorities that have jurisdiction.
- E. Pre-Installation Conference: Prior to start of installation of metal framing systems, meet at project site with installers of other work including door and window frames and mechanical and electrical work. Review areas of potential interference and conflicts, and coordinate layout and support provision for interfacing work. Do not begin work until all unsatisfactory work is corrected.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Store products in manufacturer's unopened packaging until ready for installation per requirements of ASTM C645.

**1.07 PROJECT CONDITIONS**

**Construction Specification****COLD FORMED METAL FRAMING**

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

**PART 2 - PRODUCTS****2.01 MANUFACTURERS**

- A. Manufacturers: Current members of the steel stud manufacturers association (SSMA), reference SSMA's website at [www.ssma.com](http://www.ssma.com) for current member listings. Subject to compliance with requirements, provide products from:
  - 1. Dietrich Metal Framing
  - 2. MarinoWare
  - 3. The Steel Network, Raleigh, NC 27615, Phone (919) 845-1025, Fax (919) 845-1028

**2.02 MATERIALS**

- A. Cold-Formed Steel: Complying with ASTM A 1003/A 1003M; unless indicated otherwise.
- B. Galvanized Coating:
  - 1. Load Bearing: G60 coating weight minimum, complying with ASTM C 955.
  - 2. Non-Load Bearing: G40 coating weight minimum, complying with ASTM C 645.
- C. The physical and structural properties listed in the manufacturer's tables shall be considered the minimum permitted for all framing members.

**2.03 LOAD-BEARING METAL FRAMING COMPONENTS**

- A. System Components: Manufacturers' standard load-bearing steel studs of type, size, shape, and gage as indicated in drawings. With each type of metal framing required, provide manufacturer's standard steel runners (tracks), blocking, lintels, clip angles, shoes, reinforcements, fasteners, and accessories for applications indicated, as needed to provide a complete metal framing system.
- B. All framing members shall be manufactured and supplied by one manufacturer.
- C. Studs: Cold-formed galvanized steel C-Studs:
- D. Runner Track: Cold-formed galvanized steel Structural Runner Track. Material thickness to match stud/joist thickness unless design dictates heavier thickness. 20 Gauge track thickness is acceptable with the use of a deflection clip for exterior wall that require vertical deflection.
- E. Slotted Deflection Track:
  - 1. Standard leg of 2 1/2 inches with standard vertical slot of 1 1/2 inches in leg.
  - 2. Product available with 2 1/2 drift slots in web 'special order'.
  - 3. Tracks relying on steel flexure to perform are unacceptable.
- F. Vertical Deflection Clips:
  - 1. Connections must be tested in accordance to ICC AC261 criteria and hold a valid ICC-ES evaluation service to be accepted.
  - 2. Design clips for positive attachment to structure and stud web using step-bushings to permit frictionless vertical movement.
  - 3. Provide clips with attached bushing and screw of the series, size and configuration as required by the structural design calculations.
- G. Drift Clips:
  - 1. Design clips for positive attachment to structure and stud web using step-bushings to permit frictionless lateral and vertical movement.
  - 2. Provide clips with attached bushing and screw of the series, size and configuration as required by the structural design calculations.
- H. Clip Angles (Support Clips):
  - 1. Engineered rigid connections by a sole manufacturer, no field fabricated connections will be accepted.
- I. Bridging:
  - 1. U-Channel:  
OR
  - 2. Bridging/Spacer Bar:



**Construction Specification****COLD FORMED METAL FRAMING**

- a. Minimum Delivered Thickness: 20 gauge, 0.0329 inch (0.84 mm)
  - 3. Bridging Clip:
    - a. Design bridging clips for attachment to stud web and wrapping around the bridging channel. Bridging accessories shall be formed from structural quality steel with minimum yield strength of 50 ksi and have minimum protective coating of G-90 (Z275)
  - J. Web Stiffeners: One-piece web stiffeners attached to joist ends to prevent web crippling.
  - K. Floor Joists: Cold-formed Galvanized Steel C-Joist Floor System:
  - L. Load-Bearing Headers:
  - M. L-Header (Cold-formed galvanized one-piece load-bearing header)
- 2.04 NON-LOAD BEARING METAL FRAMING COMPONENTS**
- A. System Components: Manufacturers' standard non-load-bearing steel studs of type, size, shape, and gage as indicated. With each type of metal framing required, provide manufacturer's standard steel runners (tracks), blocking, lintels, clip angles, shoes, reinforcements, fasteners, and accessories for applications indicated, as needed to provide a complete metal framing system.
  - B. Studs: Cold-formed galvanized steel drywall C-studs
    - 1. Flanges: Equal lengths 1-1/4 inches (.32 mm)
    - 2. Section Properties: Manufacturer's standard section properties.
  - C. Runner Track: Cold-formed galvanized steel drywall runner track. Thickness equal to stud thickness minimum or heavier per design requirements. 20 gauge track thickness is acceptable with the use of a deflection clip for walls that require vertical deflection.
  - D. Deflection Track: Cold-formed galvanized steel
    - 1. Standard leg 2-1/2 inches
    - 2. Standard Vertical Slot of 1-1/2 inches in leg
    - 3. Product available within 2-1/4 inches drift, slots in web "special order"
    - 4. Minimum yield strength of 50 ksi in 16 gauge and heavier and minimum yield strength of 33 ksi in 18 gauge and lighter
  - E. Furring Channel: Cold-formed galvanized steel furring channel
  - F. U Channel: Cold-formed galvanized steel U channel
  - G. Metal Trims: Cold-formed galvanized steel J, U, and L Trims
  - H. Drywall Corner Bead: Cold-formed galvanized steel sheet.
    - 1. Type: Heavy Construction – CBS hot dipped galvanized.
    - 2. Flange Length: 1-1/4 inches (32 mm).
- 2.05 ACCESSORIES**
- A. Special Solid Backing Support Plates:
    - 1. Manufacturer's plates designed to provide a solid backing support for handrails, wall-mounted shelving and similar equipment. Comply with ASTM 1003/A1003M or ASTM A653/A653M.
  - B. Framing Component: Provide the following accessories as required for a complete system.
    - 1. Flat Strapping.
    - 2. Angles, Plates, Sheets.
    - 3. Backing Strip.
    - 4. Custom Brake-Formed Shapes.
  - C. Mechanical Fasteners:
    - 1. ASTM C1513-04, corrosion-resistant-coated, self-piercing or self-drilling/self-tapping steel screws. Fasteners must be tested in accordance to ICC AC118 criteria and hold a valid ICC-ES evaluation service report to be accepted.
    - 2. Galvanized coating, plated or oil-phosphate coated complying with ASTM B 633 as needed for required corrosion resistance.

**Construction Specification****COLD FORMED METAL FRAMING**

- D. Power-Actuated Anchors:
  - 1. ASTM E1190-95 (2007), fabricated from corrosion-resistant materials. Fastener system to be of type suitable for application indicated. Anchors must be tested in accordance to ICC AC70 criteria and hold a valid ICC-ES evaluation service report to be accepted.
- E. Touch-Up Paint: Metallic zinc cold galvanizing compound, ZRC-221 by ZRC Worldwide or equal as required
- F. Non-Hardening, Flexible Sealant: Latex acrylic.

**2.06 FABRICATION**

- A. General: Framing components may be prefabricated into assemblies before erection. Fabricate panels plumb, square, true to line, and braced against racking with joints welded. Perform lifting of prefabricated units to prevent damage or distortion.
- B. Fabricate panels square, with components attached in a manner so as to prevent racking or distortion.
- C. Cut all framing components squarely for attachment to perpendicular members, or as required for an angular fit against abutting members. Hold members positively in place until properly fastened. If pre-fabricated, fabricate units in jig templates to hold members in proper alignment and position and to assure consistent component placement.
- D. Axially Loaded Studs:
  - 1. Install studs to have full bearing against inside track web (1/8 inches (3.2 mm) maximum gap) prior to stud and track attachment.
  - 2. Splices in axially loaded studs are not permitted.
- E. Fastenings: Attach similar components by means of mechanical fasteners or welding. Attach dissimilar components by welding, bolting, or self-tapping screw fasteners, as standard with manufacturer.
- F. Welding: Welding is permitted on 18 gauge or heavier material only.
  - 1. Specify welding configuration and size on the Structural Calculation submittal.
  - 2. Qualify welding operators in accordance with Section 6.0 of AWS D.1.3.
  - 3. Touch up all welds with zinc-rich paint in compliance with ASTM A 780.
- G. Wire tying of framing components not permitted.
- H. Fabrication Tolerances: Fabricate units to a maximum allowable tolerance variation from plumb, level, and true to line of 1/8 inch in 10 feet with a maximum deflection of L/360.

**PART 3 - EXECUTION****3.01 EXAMINATION**

- A. Prior to installation, inspect previous work of all other trades. Verify that all work is complete and accurate to the point where this installation may properly proceed in strict accordance with framing shop drawings.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

**3.02 INSTALLATION**

- A. General: Install metal framing systems in accordance with manufacturer's printed or written instruction and recommendations and in accordance with requirements of ASTM C 754.
- B. Runner Tracks: Install continuous tracks sized to match studs. Align tracks accurately to layout at base and tops of studs. Secure tracks as recommended by stud manufacturer for type of construction involved, except do not exceed 24 inches o.c. spacing for nail or power-driven fasteners or 16 inches o.c. for other types of attachment. Provide fasteners at corners and at ends of tracks.
- C. Installation of Wall Studs: Secure studs to top and bottom runner tracks by either welding or screw fastening at both inside and outside flanges unless deflection connections are required at head of the wall.
- D. Splicing of studs will not be permitted.
- E. Cutting: All cutting shall be done with a power-driven saw with appropriate abrasive blade. No hand cutting will be permitted. All cuts shall be clean, accurate, and true to line. No torch cutting will be permitted.

**Construction Specification****COLD FORMED METAL FRAMING**

- F. Set studs plumb, except as needed for diagonal bracing or required for non-plumb walls or warped surfaces and similar requirements.
- G. Where stud system abuts structural columns or walls, including masonry walls, anchor ends of stiffeners to supporting structure. Metal framing systems located on concrete or masonry surfaces shall be attached to the surfaces with power-driven fasteners at 24" o.c. unless noted otherwise.
- H. Install supplementary framing, blocking, and bracing in metal framing system wherever walls or partitions are indicated to support fixtures, equipment, services, casework, heavy trim and furnishings, veneer and exterior finishes, and similar work requiring attachment to the wall or partition. Where type of supplementary support is not otherwise indicated, comply with stud manufacturer's recommendations and industry standards in each case, considering weight or loading resulting from item supported.
- I. Frame wall openings larger than 2 feet square with double stud at each jamb of frame except where more than two are either shown or indicated in manufacturer's instructions. Install runner tracks and jack studs above and below wall openings. Anchor tracks to jamb studs with stud shoes or by welding, and space jack studs same as full-height studs of wall. Secure stud system wall opening frame in manner indicated.
- J. Frame both sides of expansion and control joints with separate studs; do not bridge the joint with components of stud system.
- K. Install horizontal stiffeners in stud system, space (vertical distance) at not more than 48 inches o.c. Weld at each intersection.
- L. Erection Tolerances: Bolt or weld wall panels (at both horizontal and vertical junctures) to produce flush, even true-to-line joints. Maximum variation in plan and true position between prefabricated assemblies should not exceed 1/16 inch.
- M. Installation of Joists: Install level, straight, and plumb complete with bracing and reinforcing as indicated on drawings. Provide not less than 1-1/2 inch end bearing. Reinforce ends with end clips, steel hangers, steel angle clips, steel stud section, or as otherwise recommended by joist manufacturer.

**3.03 PROTECTION**

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

**PART 1 - GENERAL****1.01 SUMMARY**

- A. Extent of metal fabrications is indicated on drawings and includes, but is not limited to the following:

1. Rough hardware
2. Fasteners
3. Ladders and cages
4. Loose bearing and leveling plates
5. Loose steel lintels
  - a. Miscellaneous framing and supports
6. Pipe bollards
7. Downspout guards
8. Burglar bars
9. Steel pipe railings (if indicated on drawings)
10. Exterior Floor Grating Treads and Platforms (if indicated on drawings)
11. Interior Metal Pan Stairs (if indicated on drawings)
12. Cast tread nosing (if indicated on drawings)
13. Expanded metal for railing infill (if indicated on drawings)

- B. Related work specified elsewhere includes but may not be limited to:

1. Section 03600 - Non-Shrink Grout
2. Section 09900 - Painting
3. Section 10606 - Chain Link Fences and Gates
4. Section 10612 - Ornamental Fences and Gates (if applicable)

**1.02 DEFINITIONS**

- A. Definitions in ASTM E 985 for railing-related terms applying to this section.

**1.03 SYSTEM PERFORMANCE REQUIREMENTS**

- 1.04 Structural Performance: Design, engineer, fabricate, and install the following metal fabrications to withstand the following structural loads without exceeding the allowable design working stress of the materials involved, including anchors and connections. Apply each load to produce the maximum stress in each respective component of each metal fabrication.

1. Comply with the requirements of the authorities having jurisdiction at site location if those requirements are more stringent than those indicated herein.
2. Pipe Railings (if indicated on drawings): Capable of withstanding the following loads applied as indicated:
  - a. Concentrated load of 250 lbs applied at any point non-concurrently, vertically downward, or horizontally.
  - b. Uniform load of 50 lbs per linear foot applied non-concurrently, vertically downward or horizontally.
  - c. Concentrated and uniform loads above need not be assumed to act concurrently.
3. Treads of Steel Stairs: Capable of withstanding the following loads applied as indicated:
  - a. Uniform load of 100 LB per square foot or a concentrated load of 300 LB on an area of 4 square inches located in the center of the tread, whichever produces the greater stress.
4. Platforms of steel stairs: Capable of withstanding a uniform load of 100 LB per square foot.
5. Stair Framing: Capable of withstanding stresses resulting from loads specified above as well as stresses resulting from railing system loads.

**1.05 SUBMITTALS TO CONTRACTOR**

- A. General: Submit the following:

1. Shop drawings detailing fabrication and erections of each metal fabrication indicated. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items. Provide templates for anchors and bolts specified for installation under other sections.
  - a. Where installed metal fabrications are indicated to comply with certain design loadings, include structural computations, material properties, and other information needed for structural analysis that has been signed and sealed by the qualified professional engineer who was responsible for their preparation.
2. Welder Certificates signed by Contractor certifying that welders comply with requirements specified under "Quality Assurance" article.

**1.06 QUALITY ASSURANCE**

- A. Fabricator Qualifications: Firm experience in successfully producing metal fabrications similar to that indicated for this Project, with sufficient production capacity to produce required units without caused delay in the Work.
- B. Installer Qualifications: Arrange for installation of metal fabrications specified in this section by same firm that fabricated them.

- C. Qualify welding processes and welding operators in accordance with AWS D1.1 "Structural Welding Code - Steel," D1.3 "Structural Welding Code - Sheet Steel", and D1.2 "Structural Welding Code - Aluminum."
  - 1. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.
- D. Engineer Qualifications: Professional engineer licensed to practice in jurisdiction where project is located and experienced in providing engineering services of the kind indicated that have resulted in the successful installation of metal fabrications similar in material, design, and extent to that indicated for this Project.

## PART 2 - PRODUCTS

### 2.01 FERROUS METALS

- A. Metal Surfaces, General: For metal fabrications exposed to view upon completion of the Work, provide materials selected for their surface flatness, smoothness, and freedom from surface blemishes. Do not use materials whose exposed surfaces exhibit pitting, seam marks, roller marks, rolled trade names, roughness, and, for steel sheet, variations in flatness exceeding those permitted by reference standards for stretcher-leveled sheet.
- B. The following steel shapes shall be manufactured in the USA containing 90% recycled steel.
  - 1. Steel Plates, Shapes, and Bars: ASTM A 36.
  - 2. Cold-Formed Steel Tubing: ASTM A 500, Grade A, or Grade B as indicated or required for design loading.
  - 3. Hot-Formed Steel Tubing: ASTM A 501.
    - a. For exterior installations and where indicated, provide tubing with hot-dip galvanized coating per ASTM A 53.
  - 4. Cold-Rolled Structural Steel Sheet: ASTM A 611, Grade A, unless otherwise indicated or required by design loading.
  - 5. Steel Pipe: ASTM A 53, Schedule 40 unless otherwise indicated.
    - a. Black finish, unless otherwise indicated.
    - b. Galvanized finish for exterior installations and where otherwise indicated.
- C. Cold-Rolled Steel Sheet, Commercial quality: ASTM A 366, produced from steel containing a minimum of 65% recycled steel.
- D. Galvanized Steel Sheet: Quality as follows:
  - 1. Structural Quality: ASTM A653; Grade A, unless another grade required for design loading, and G90 coating designation unless otherwise indicated.
  - 2. Commercial Quality: ASTM A 526, G90 coating designation unless otherwise indicated.
- E. Gray Iron Castings: ASTM A 48, Class 30.
- F. Malleable Iron Castings: ASTM A 47, grade 32510
- G. Brackets, Flanges, and Anchors (if indicated on the drawings): Cast or formed metal of the same type of material and finish as supported rails, unless otherwise indicated.
- H. Concrete Inserts: Threaded or wedge type; galvanized ferrous castings, either malleable iron, ASTM A 47, or cast steel, ASTM A 27. Provide bolts, washers, and shims as required, hot-dip galvanized per ASTM A 153.
- I. Welding Rods and Bare Electrodes: Select in accordance with AWS specifications for the metal alloy to be welded.

### 2.02 FASTENERS

- A. General: Provide zinc-coated fasteners for exterior use or where built into exterior walls. Select fasteners for the type, grade and class required.
  - 1. Bolts and Nuts: Regular hexagon head type, ASTM A 307, Grade A.
  - 2. Lag Bolts: Square head type, FS FF-B-561.
  - 3. Machine Screws: Cadmium plated steel, FS FF-S-92
  - 4. Wood Screws: Flat head carbon steel, FS FF-S-111.
  - 5. Plain Washers: Round, carbon steel, FS FF-W-92.
  - 6. Drilled-In Expansion Anchors: Expansion anchors complying with FS FF-S-325, Group VIII (anchors, expansion, {non-drilling}), Type I (internally threaded tubular expansion anchor); and machine bolts complying with FS FF-B-575, Grade 5.
  - 7. Toggle Bolts: Tumble-wing type, FS FF-B-588, type, class, and style as required.
  - 8. Lock Washers: Helical spring type carbon steel, FS FF-W-84.

### 2.03 GROUT AND ANCHORING CEMENT

- A. Refer to section 03600 - Non-Shrink Grout

**Construction Specification****METAL FABRICATIONS****2.04 ROUGH HARDWARE**

- A. Furnish bent or otherwise custom fabricated bolts, plates, anchors, hangers, dowels, and other miscellaneous steel and iron shapes and required for framing and supporting woodwork, and for anchoring or securing woodwork to concrete or other structure. Straighten bolts and other stock rough hardware items are specified in Division 6 sections.
- B. Fabricate items to sizes, shapes, and dimensions required.

**2.05 STEEL LADDERS/CAGES**

- A. Industry Standards:
  - 1. OSHA/ANSI A14.3 "Safety Code for Fixed Ladders" specifies the minimum design requirements for ladders and safety cages.
- B. Fabricate Ladders for locations shown, with dimensions, spacings, details and anchorages as required. Comply with requirements of OSHA/ANSI A14.3 except as otherwise shown or specified.
  - 1. Unless otherwise shown, provide channel rail full height side rails with eased edges.
  - 2. Provide solid structural steel bar rungs.
- C. Fit rungs into punched holes in centerline of side rails, plug weld and grind smooth on outer rail faces.
- D. Support each ladder at top and bottom. Use welded or bolted steel brackets, designed for adequate support and anchorage and to hold the ladder 7" clear of the wall surface and other obstructing construction.
- E. Provide non-slip surface on top of each rung, either by coating the rung with aluminum oxide granules set in epoxy resin adhesive, or by using a type of manufactured rung which is filled with aluminum oxide grout.
  - 1. Shop prime all ladders, brackets and fasteners.
  - 2. Ladders, brackets and fasteners to be field painted.
- F. Ladder safety cages: Fabricate ladder safety cages from structural steel flat bars, assembled by welding or bolting. Unless otherwise shown, provide 5/16" x 4" top and bottom hoops and intermediate hoops spaced not more than 20'-0" o.c.; 5/16" x 2" hoops at 4'-0" o.c. between the 4" wide hoops, and 5/16" x 2" vertical bars, secured to each hoop. Space vertical bars not more than 9" o.c. Fasten assembled safety cage to ladder rails with 1/2" steel bolts.
  - 1. Shop prime all ladder safety cages, security door (if indicated on drawings) and fasteners.
  - 2. Ladder safety cages, security door (if indicated on drawings) and fasteners to be field painted.
- G. Pre-manufactured ladder may be purchased in lieu of fabricated ladder. The following products may be used, or approved equivalent.
  - 1. Alaco Ladder Company: Roof Hatch Access with Cage, Model 560-C – Roof Hatch Access.
  - 2. O'Keeffe's, Inc.: Heavy Duty Tubular Rails Aluminum Cage Ladder – Model 531.

**2.06 LOOSE BEARING AND LEVELING PLATES**

- A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction, made flat, free from warps or twists, and of required thickness and bearing area. Drill plates to receive anchor bolts and for grouting as required. Galvanize after fabrication.

**2.07 LOOSE STEEL LINTELS**

- A. Fabricate loose structural steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated.
- B. Size loose lintels for equal bearing of one inch per foot of clear span but not less than 8 inches bearing at each side of openings, unless otherwise indicated.
- C. Galvanize loose steel lintels located in exterior walls.

**2.08 MISCELLANEOUS FRAMING AND SUPPORTS**

- A. General: Provide steel framing and supports for applications indicated or which are not parts of structural steel framework, as required to complete work.
- B. Fabricate units to sizes, shapes, and profiles indicated and required to receive adjacent other construction retained by framing and supports. Fabricate from structural steel shapes, plates, and steel bars or welded construction using mitered joints for field connection. Cut, drill, and tap units to receive hardware hangers, and similar items.

1. Equip units with integrally welded anchors for casting into concrete or building into masonry. Furnish inserts if units must be installed after concrete is placed.
    - a. Except as otherwise indicated, space anchors 24 inches o.c. and provide minimum anchor units in the form of steel straps 1-1/4 inches wide X 1/4 inch X 8 inches long.
- 2.09 PIPE BOLLARDS:
- A. Fabricate pipe bollards from schedule 40 steel pipe of size indicated on drawings.
  - B. Provide 1/8" thick plastic bumper post sleeves for bollards where specified in drawings manufactured by:
    1. Cal Pipe, 515 E. 88th Place, Los Angeles, CA 90003, (800) 225-7473
    2. Eagle Manufacturing Company, 2400 Charles Street, Wellsburg, WV 26070, (304) 737-3171
    3. Ideal Shield, 2525 Clark Street, P.O. Box 09210, Detroit, MI 48209, (313) 842-7290
    4. Encore Commercial Products/Post Guard, 24370 Northwestern Highway Suite 250, Southfield, MI 48075, (866) 737-8900
- 2.10 DOWNSPOUT GUARDS:
- A. Provide 36" high downspout pipe guards fabricated from bent steel where specified in drawings as manufactured by:
    1. Omega Industrial Products, 795 Progress Drive, Saukville, WI 53080, (800) 521-8272
    2. Beacon Industries, Inc, 12300 old Tesson Rd., St. Louis, MO 63128, (800) 454-7159
  - B. Finish: factory powder coated safety yellow
- 2.11 BURGLAR BARS (if Indicated on drawings):
- A. Fabricate burglar bar units from material indicated.
  - B. Material:
    1. Frames: Steel as detailed.
    2. Bars: 1/2-inch diameter grade 60 round steel bar.
  - C. Weld all joints and grind smooth. Space bars not more than 8 inches o.c., both ways, equally spaced, and weld all around to steel frame members.
  - D. At masonry openings (if any) provide weld steel strap anchors at top, bottom and jambs of frame, 3 places each side.
- 2.12 STEEL PIPE RAILINGS (if Indicated on drawings)
- A. General: Fabricate pipe railings and handrails to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thickness of pipe, post spacing, and anchorage, but not less than that required to support structural loads.
  - B. Interconnect railings and handrail members by butt-welding or welding with integral connectors, at fabricator's option, unless otherwise indicated.
    1. At tee and cross intersections, notch ends of intersecting member to fit contour of pipe to which end is joined and weld all around.
    2. Form changes in direction of railing members as follows:
      - a. By insertion of prefabricated elbow fittings.
      - b. By radius bends of radius indicated.
      - c. By mitering at elbow bends.
      - d. By bending.
      - e. By any method indicated above, applicable to change of direction involved.
  - C. Form simple and compound curves by bending pipe in jigs to produce uniform curvature for each repetitive configuration required; maintain cylindrical cross-section of pipe throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of pipe.
  - D. Provide wall returns at ends of wall-mounted handrails, unless otherwise indicated.
  - E. Close exposed ends of pipe by welding 3/16 inch thick steel plate in place or by use of prefabricated fittings, except where clearance of end of pipe and adjoining wall surface is 1/4 inch or less.
  - F. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings, and anchors for interconnections of pipe and attachment of railings and handrails to other work. Furnish inserts and other anchorage devices for connecting railing and handrails to concrete or masonry work.

1. For railing posts set in concrete fabricate sleeves from steel pipe not less than 6 inches long with an inside diameter not less than ½ inch greater than the outside diameter of post, with steel plate closure welded to bottom of sleeve.
  - G. Fillers: Provide steel sheet or plate fillers of thickness and size indicated or required to support structural loads of handrails where needed to transfer wall bracket loads through wall finishes to structural supports. Size fillers to suit wall finish thicknesses. Size fillers to produce adequate bearing to prevent bracket rotation and overstressing of substrate.
  - H. For exterior steel railings and handrails formed from galvanized steel pipe.
  - I. Railing Infill: Chain link fabric.
- 2.13 EXTERIOR FLOOR GRATING TREADS AND PLATFORMS (if indicated on drawings)
- A. Fabricate to comply with ANSI/NAAMM MBG 531 Metal Bar Grating Manual.
  - B. Provide Galvanized Steel Grating Treads and Platforms: 1" x 3/16" bearing bars at 7/16" o.c. and cross bars at 4" o.c.
  - C. Serrated surface treads with cast abrasive nosing with steel angle carrier at each end for stringer connections. Platforms with nosing to match tread nosing.
- 2.14 INTERIOR METAL PAN STAIRS (if indicated on drawings)
- A. Metal pan risers, subtreads, and subplatforms: Shape metal pans for risers and subtreads to conform to configuration shown. Provide thicknesses of structural steel sheet for metal pans indicated, but not less than that required, to support total design loading.
  - B. Form metal pans of galvanized steel sheet.
  - C. Attach risers and subtreads to stringers with brackets made of steel angles or bars. Weld brackets to stringers and attach metal pans to brackets by welding, riveting or bolting.
  - D. Shape metal pans to include nosing integral with riser.
  - E. At contractor's option, provide pre-fabricated stair assemblies with pre-filled treads consisting of pre-poured reinforced concrete fill, with nonslip aggregate finish, in welded sheet metal pan, attached to installed stringers using manufacturer's standard connection detail.
- 2.15 CAST TREAD NOSING (if indicated on drawings)
- A. Fabricate units of material, sizes and configurations indicated. If not indicated, provide cast iron units with integral abrasive finish. Furnish in lengths as required to accurately fit each opening or conditions.
  - B. Provide hatched surfaces.
  - C. Cast units with an integral abrasive grit consisting of aluminum oxide, silicone carbide, or a combination of both.
  - D. Manufacturer: Subject to compliance with requirements, provide cast treads and thresholds of one of the following:
    1. Balco: Type CF-300 (3" Cast Iron)
    2. or equal
  - E. Provide anchors for embedding units in concrete, either integral or applied to units, as standard with the manufacturer.
- 2.16 EXPANDED METAL RAILING INFILL (if indicated on drawings)
- A. Provide expanded metal security mesh for railing infill where indicated on drawings.
    1. Metal: Carbon Steel
    2. Style: 3/4" No. 9F(flattened)
    3. Weight: 171 lbs. per 100 sq.ft.
    4. Thickness: .125 inches
    5. Sheet Size: Width required x longest lengths practicable for intended use.
- 2.17 FINISHES, GENERAL
- A. Comply with NAAMM "Metal Finishes Manual" for recommendations relative to application and designations of finishes.
  - B. Finish metal fabrications after assembly.
- 2.18 STEEL AND IRON FINISHES



**Construction Specification****METAL FABRICATIONS**

- A. Galvanizing: For those items indicated for galvanizing, apply zinc-coating by the hot-dip process compliance with the following requirements:
  - 1. ASTM A 153 for galvanizing iron and steel hardware.
  - 2. ASTM A 123 for galvanizing both fabricated and unfabricated iron and steel products made of uncoated rolled, pressed, and forged shapes, plates, bars, and strip 0.0299 inch thick and heavier.
- B. Preparation for Shop Priming: Prepare uncoated ferrous metal surfaces to comply with minimum requirements indicated below for SSPC surface preparation specifications and environmental exposure conditions of installed metal fabrications:
  - 1. Exteriors (SSPC Zone 1B): SSPC-SP6 "Commercial Blast Cleaning."
  - 2. Interiors (SSPC Zone 1A): SSPC-SP3 "Power Tool Cleaning"

**2.19 PAINT**

- A. All paint products provided shall be VOC compliant for building location.
- B. Refer to Section 09900 for applicable paint system requirements.

**PART 3 - EXECUTION****3.01 PREPARATION**

- A. Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, including concrete inserts, sleeves, anchor bolts, and miscellaneous items having integral anchors that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to project site.
- B. Center nosings on tread widths with nose flush with riser faces and tread surfaces.

**3.02 FABRICATION**

- A. Form metal fabrications from materials of size, thickness, and shapes indicated but not less than that needed to comply with performance requirements indicated. Work to dimensions indicated or accepted on shop drawings, using proven details of fabrications and support. Use type of materials indicated or specified for various components of each metal fabrication.
- B. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges.
- C. Allow for thermal movement in the design, fabrication, and installation of installed metal assemblies to prevent buckling, opening up on joints, and overstressing of welds and fasteners. Base design calculations on actual surface temperatures of metals due to both solar heat gain and nighttime sky heat loss.
- D. Shear and punch metals cleanly and accurately. Remove burrs.
- E. Ease exposed edges to a radius of approximately 1/32 inch, unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- F. Remove sharp or rough areas on exposed traffic surfaces.
- G. Weld Corners and Seams continuously to comply with AWS recommendations and the following:
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove welding flux immediately.
  - 4. At exposed connections, finish exposed welds and grind surfaces smooth and blended so that no roughness shows after finishing and contour of welded surface matched those adjacent.
- H. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of type indicated or, if not indicated, Phillips flat-head (countersunk) screws or bolts. Locate joints where least conspicuous.
- I. Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space anchoring device as to provide adequate support for intended use.
- J. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- K. Cut, reinforce, drill and tap miscellaneous metal work as indicated to receive finish hardware, screws, and similar items.
- L. Fabricate joints that will be exposed to weather in a manner to exclude water, or provide weep holes where water may accumulate.

**3.03 INSTALLATION, GENERAL**

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction; include threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws, and other connectors as required.
- B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installation of miscellaneous metal fabrications. Set metal fabrication accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- C. Provide temporary bracing or anchors in formwork for items that are to be built into concrete masonry or similar construction.
- D. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade the surfaces of exterior units which have been hot-dip galvanized after fabrication, and are intended for bolted or screwed field connections.
- E. Field Welding: Comply with AWS Code for procedures of manual shielded metal-arc welding, appearance and quality of welds made, methods used in correcting welding work, and the following:
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove welding flux immediately.
  - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing and contour of welded surface matches those adjacent.

**3.04 INSTALLATION OF STEEL PIPE RAILINGS AND HANDRAILS (if indicated on drawings)**

- A. Anchor posts in concrete by means of pipe sleeves preset and anchored into concrete. After posts have been inserted into sleeves, fill annular space between post and sleeve solid with nonshrink, nonmetallic grout.
- B. Leave anchorage joint exposed, wipe off surplus anchoring material, and leave 1/8 inch build-up, sloped away from post. For installations exposed on exterior, or to flow of water, seal anchoring material to comply with grout manufacturer's directions.
- C. Anchor rail ends into concrete and masonry with steel round flanges welded to rail ends and anchored into wall construction with lead expansion shields and bolts.

**3.05 INSTALLATION OF BURGLAR BARS (if indicated on drawings)**

- A. Where installed in roof openings, weld units to structural framing of opening.

**3.06 ADJUSTING AND CLEANING**

- A. Touch-Up Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting to comply with SSPC-PA 1 requirements for touch-up of field painted surfaces.
  - 1. Apply by brush or spray to provide a minimum dry film thickness of 2.0 mils.
- B. For galvanized surfaces clean welds, bolted connections and abraded areas and apply galvanizing repair paint to comply with ASTM A 780.

**END OF SECTION**

**Construction Specification****SHEET METAL FABRICATIONS****PART 1 - GENERAL****1.01 SUMMARY**

- A. This Section includes the following:
  - 1. Exterior man door hoods.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
  - 1. Section 07600 "Flashing and Sheet Metal" for items made of sheet metal for flashing purposes.
  - 2. Section 07901 "Joint Sealers".
  - 3. Section 09900 "Painting" for field finish.

**1.02 PERFORMANCE REQUIREMENTS**

- A. Design: Manufacturer to design door hood needs to meet wind loads as set forth in local building codes.

**1.03 QUALITY ASSURANCE**

- A. Single-Source Responsibility: Obtain sheet metal fabrications from a single manufacturer.

**1.04 DELIVERY, STORAGE AND HANDLING**

- A. Deliver sheet metal fabrications as factory-assembled units with protective crating and covering. Remove protective covering before it stains or bonds to finished surfaces.
- B. Store products on elevated platforms in a dry location.

**PART 2 - PRODUCTS****2.01 SHEET METAL**

- A. General: Provide sheet metal selected for surface flatness, smoothness and freedom from surface blemishes where exposed to view in the finished unit. Do not use materials with pitting, seam marks, roller marks, variations in flatness exceeding those permitted by referenced standards for stretcher-leveled metal sheet, stains, discoloration or other imperfections.
  - 1. Galvanized-Steel Sheet: ASTM A 526/A 526M (lock-forming quality), manufactured in the USA containing a minimum of 65% recycled steel. Coating Designation G-90 (Z275), mill phosphatized, stretcher leveled.
    - a. Refer to drawings for gauge of metal.

**2.02 MISCELLANEOUS MATERIALS**

- A. Welding Electrodes and Filler Metal: Type and alloy of filler metal and electrodes as recommended by producer of metal to be welded, complying with applicable AWS specifications, and as required for strength and compatibility in the fabricated items.
- B. Fasteners: Of same basic metal and alloy as fastened metal, unless otherwise indicated. Do not use metals that are corrosive or incompatible with metals joined.
- C. Structural Anchors: For applications indicated provide anchors of type indicated below, fabricated from corrosion-resistant materials:
  - 1. Expansion anchors.

**2.03 FABRICATION GENERAL**

- A. General: Fabricate sheet metal to comply with requirements indicated for design, dimensions, materials, joinery and performance.
- B. Coordinate dimensions and attachment methods of sheet metal fabrications with those of adjoining products and construction to produce integrated assemblies with closely fitting joints and with edges and surfaces aligned with one another in the relationship indicated.
- C. Increase metal thickness or reinforce metal with concealed stiffeners as required to produce surfaces whose variations in flatness do not exceed those permitted by referenced standards for stretcher-leveled metal sheet and to impart sufficient strength for indicated use.
- D. Form sheet metal fabrications to profiles indicated in maximum lengths to minimize joints and without exposed cut edges. Fold back exposed ends of unsupported sheet metal to form a  $\frac{1}{4}$ -inch wide hem on the concealed side, or ease exposed edges with backing to a radius of approximately 1/32 inch. Produce flat, flush surfaces without cracking or grain separation at bends.

**Construction Specification****SHEET METAL FABRICATIONS**

- E. Continuously weld joints and seams, except where other methods of joining are indicated. Grind, fill and dress welds to produce smooth flush exposed surfaces in which welds are not visible after final finishing is completed.
- F. Build in straps, plates and brackets as required for supporting and anchoring fabricated items to adjoining construction.

**2.04 GALVANIZED-STEEL SHEET FINISHES**

- A. Surface Preparation: Clean surfaces of dirt, grease or other contaminants followed by a conversion coating of type suited to organic coating applied over it. Clean welds, mechanical connections and abraded areas and apply galvanizing repair paint specified below to comply with ASTM A 780.
  - 1. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in galvanized steel, with dry film containing not less than 94 percent zinc dust by weight, and complying with DOD-P-21035 or SSPC-Paint 20.
- B. Factory Priming for Field Painted Finish: Where field painting after installation is indicated, apply air-dried primer specified below immediately following cleaning and pretreatment.
  - 1. Shop Primer: Zinc-dust, zinc oxide primer paint complying with performance requirements of FS TT-P-641, Type II.

**PART 3 - EXECUTION****3.01 INSTALLATION**

- A. Locate and place sheet metal fabrications plumb, level and in alignment with adjacent construction.
- B. Provide brass or lead washers fitted to screws where required to protect sheet metal surfaces and to make weather tight connection.
- C. Provide returns for sealants as indicated.
- D. Install concealed gaskets, joint fillers and flashings as the work progresses to make work weatherproof, as required.
- E. Corrosion Protection: Coat concealed surfaces of zinc-coated metals that will be in contact with grout, concrete, masonry or dissimilar metals, with a heavy coat of bituminous paint.

**3.02 PROTECTION**

- A. Protect finishes of sheet metal fabrications from damage during the construction period. Remove temporary protective coverings at the time of Substantial Completion.

**END OF SECTION**

**PART 1 - PART 1 - GENERAL****1.01 SUMMARY**

- A. Extent of rough carpentry work is indicated on drawings and includes, but is not limited to, the following:
  - 1. Miscellaneous wood framing
  - 2. Wood nailers or blocking
  - 3. Plywood (Fire Retardant Treated)
  - 4. Oriented Strand Boards (OSB)
- B. All interior wood used for construction shall be fire retardant treated.
- C. All wood in roof construction and non-load bearing wall where the fire resistance rating is 1 hour or less, shall be fire resistant treated wood where required by code
- D. Related work specified elsewhere includes but may not be limited to:
  - 1. Section 01012 - Preferred Purchasing
  - 2. Section 06402: Interior Architectural Woodwork

**1.02 PREFERRED PURCHASING**

- A. Unless noted otherwise, Contractor and all subcontractors are encouraged to purchase all products listed in this specification section from a local The Home Depot Store. For more information, refer to Section 01012.

**1.03 PRODUCT HANDLING**

- A. Delivery and Storage: Keep materials under cover and dry. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber as well as plywood and other panels; provide for air circulation within and around stacks and under temporary coverings including polyethylene and similar materials.
  - 1. For lumber and plywood pressure treated with waterborne chemicals, sticker between each course to provide air circulation.

**1.04 PROJECT CONDITIONS**

- A. Coordination: Fit carpentry work to other work; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds and similar supports to allow attachment of other work.

**PART 2 - PRODUCTS****2.01 LUMBER, GENERAL**

- A. Lumber Standards: Manufacture lumber to comply with PS 20 "American Softwood Lumber Standard" and with applicable grading rules for inspection agencies certified by American Lumber Standards Committee's (ALSC) Board of Review.
- B. Inspection Agencies: Inspection agencies and the abbreviations used to reference with lumber grades and species include the following:
  - 1. SPIB - Southern Pine Inspection Bureau
  - 2. WCLIB - West Coast Lumber Inspection Bureau
  - 3. WWPA - Western Wood Product Association
- C. Grade Stamps: Factory-mark each piece of lumber with grade stamp of inspection agency evidencing compliance with grading rule requirement and identifying grading agency, grade, species, moisture content at time of surfacing, and mill.
- D. Nominal sizes are indicated, except as shown by detail dimensions. Provide actual sizes and required by PS 20, for moisture content specified for each use.
  - 1. Provide dressed lumber, S4S, unless otherwise indicated.
  - 2. Provide seasoned lumber with 19 percent maximum moisture content at time of dressing and shipment for sizes 2" or less in nominal thickness, unless otherwise indicated.
  - 3. Provide lumber harvested from certified forests.

**2.02 MISCELLANEOUS LUMBER**

- A. Provide wood for miscellaneous framing, support or attachment of other work including bucks, nailers, blocking, furring, grounds, stripping and similar members. Provide lumber of sizes indicated, worked into shapes shown, and as follows:
  - 1. Moisture content: 19 percent maximum for lumber items not specified to receive wood preservative treatment.

2. Grade: Standard grade light framing size lumber of any species or board size lumber as required. No. 3 Common or Standard grade boards per WCLIB or WWPA rules or No. 3 boards per SPIB rules.
3. Provide lumber harvested from certified forests.

### 2.03 CONSTRUCTION PANELS

- A. Construction Panel Standards: Comply with PS 1 "U.S. Product Standard for Construction and Industrial Plywood" for plywood panel and, for products not manufactured under PS 1 provisions, with American Plywood Association (APA) "Performance Standard and Policies for Structural-Use Panels", Form No. E445.
- B. Trademark: Factory-mark each construction panel with APA trademark evidencing compliance with grade requirements.
- C. APA Performance-Rated Panels: Where construction panels will be used for the following concealed types of applications, provide APA Performance-Rated Panels complying with requirements indicated for grade designation, span rating, exposure durability classification, edge detail (where applicable) and thickness.
  1. Wall Sheathing: APA RATED SHEATHING
    - a. Exposure Durability Classification: EXPOSURE 1.
      - i. Span Rating: 40/20, 19/32 - inch thick minimum, unless indicated otherwise. Use where 5/8-inch plywood or OSB is indicated on drawings.
      - ii. Span Rating: 32/16, 15/32-inch thick where 1/2-inch plywood or OSB is indicated on drawings.
      - iii. Faces: smooth face out (OSB); APA-BC (plywood)
  2. Plywood Backing Panels: For mounting electrical or telephone equipment, provide plywood panels with grade designation, APA C-D PLUGGED INT with exterior glue, in thickness indicated, or, if not otherwise indicated, not less than 23/32".

### 2.04 MISCELLANEOUS MATERIALS

- A. Fasteners and Anchorages: Provide size, type, material and finish as indicated and as recommended by applicable standards, complying with applicable Federal Specifications for nails, staples, screws, bolts, nuts, washers and anchoring devices. Provide metal hangers and framing anchors of the size and type recommended by the manufacturer for each use including recommended nails.
  1. Where rough carpentry work is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners and anchorages with a hot-dip zinc coating (ASTM A153).
- B. Provide fasteners containing a minimum of 90% recycled steel.
- C. Manufacturer
  1. Hilti

### 2.05 WOOD TREATMENT BY PRESSURE PROCESS

- A. Preservative Treatment: Where lumber or plywood is indicated as "Trt-Wd" or "Treated," or is specified herein to be treated, comply with applicable requirements of AWPB Standards listed below. Mark each treated item with the AWPB Quality Mark Requirements.
  1. OSB shall not be used where preservative treatment is required.
- B. Pressure-treat above ground items with water-borne preservatives to comply with AWPB LP-2. After treatment, kiln-dry lumber and plywood to a maximum moisture content, respectively, of 19 percent and 15 percent. Treat indicated items and the following:
  1. Wood nailers, curbs, equipment, support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers and waterproofing.
  2. Wood sills, sleepers, blocking, furring, stripping and similar concealed members in contact with masonry or concrete.
  3. Wood framing member less than 18" above grade.
  4. Wood floor plates installed over concrete slabs directly in contact with earth.
- C. Complete fabrication of treated items prior to treatment, where possible. If cut after treatment, coat cut surfaces with heavy brush coat of same chemical used for treatment, and to comply with AWPB M4. Inspect each piece of lumber or plywood after drying and discard damaged or defective pieces.

### 2.06 FIRE RETARDANT TREATED WOOD

- A. General: Lumber and plywood shall be pressure treated with fire retardant chemicals specified hereinafter. Each piece shall bear the UL label or imprint certifying on FR-rating, an interior Type A product and kiln dried after treatment (KDAT). Each piece shall carry a National Evaluation Services report number.

1. OSB shall not be used where Fire Retardant Treatment is required.
- B. Fire Retardant Treatment:
  1. All fire retardant treated wood must have an FR-S rating (flame spread and smoke developed less than 25) when tested in accordance with ASTM E-84, NFPA 255 or UL 723.
  2. All lumber must be kiln dried to maximum moisture content of 19% after treatment. All plywood, 15% maximum after treatment.
  3. All fire retardant wood must meet Interior Type A requirements in AWP standard C-20 for lumber and C-27 for plywood.

**PART 3 - EXECUTION****3.01 INSTALLATION, GENERAL**

- A. Discard units of material with defects which might impair quality of work, and units which are too small to use in fabricating work with minimum joints or optimum joint arrangement.
- B. Set carpentry work to required levels and lines, with members plumb and true to line and cut and fitted.
- C. Securely attach carpentry work to substrate by anchoring and fastening as shown and as required by recognized standards.
- D. Countersink nail heads on exposed carpentry work and fill holes.
- E. Use common wire nails, except as otherwise indicated. Use finishing nails for finish work. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting of wood; predrill as required.
- F. For exterior canopy, fascia/soffit and other construction attached to and projecting from the building, provide fire-retardant treated blocking, framing lumber or OSB plywood as indicated or as required by all applicable codes, regulations, ordinances and by authorities having jurisdiction. Fire-treated lumber and plywood shall conform to paragraph 2.06 as specified in this Section.

**3.02 WOOD NAILERS AND BLOCKING**

- A. Provide wherever shown and where required for attachment of other work. Form to shapes as shown and cut as required for true line and level of work to be attached. Coordinate location with other work involved.
- B. Attach to substrates as required to support applied loading. Countersink bolts and nuts flush with surfaces, unless otherwise indicated. Build into masonry during installation of masonry work. Where possible, anchor to formwork before concrete placement.

**3.03 PLYWOOD OR ORIENTED STRAND BOARD (OSB) WALL SHEATHING**

- A. Provide plywood or OSB wall sheathing where shown. Install horizontally using panels continuous over 2 or more spans.
- B. Apply face grain across studs where single finish is shown to be applied directly to sheathing.
- C. Install interior plywood over interior studs in full height sheets with staggered tight-butt joints. Sand joints if required to obtain joints without offsets.

**END OF SECTION**

**Construction Specification****INTERIOR ARCHITECTURAL WOODWORK****PART 1 - PART 1 – GENERAL****1.01 SUMMARY**

- A. Extent of each type of architectural woodwork is indicated on drawings and in schedules.
- B. Types of architectural woodwork include the following:
  - 1. Plastic laminate clad shelves (FBO).
  - 2. Plastic laminate clad cabinets (FBO).
  - 3. Exposed trim.
  - 4. Solid core wood gate (if required).
  - 5. Plastic laminate countertops
- C. Related work specified elsewhere includes but may not be limited to:
  - 1. Section 01012 - Preferred Purchasing
  - 2. Section 06100 - Rough Carpentry
  - 3. Section 09900: Painting (for Stains)
  - 4. Section 10166 - Toilet Partitions and Restroom Countertops

**1.02 PREFERRED PURCHASING**

- A. Unless noted otherwise, Contractor and all subcontractors are encouraged to purchase all products listed in this specification section from a local The Home Depot Store. For more information, refer to Section 01012.

**1.03 DELIVERY, STORAGE AND HANDLING**

- A. Immediately upon delivery to job site, place materials indoors, protected from weather. Maintain temperature between 55 deg. and 70 deg. F.
- B. Store materials a minimum of 6" above ground on framework or blocking and cover with protective waterproof covering providing for adequate air circulation and ventilation. Store in dry, conditioned space.

**1.04 JOB CONDITIONS**

- A. Field measurements: Take field measurements to ascertain exact millwork sizes. Indicate exact dimensions on shop drawings.

**1.05 QUALITY ASSURANCE**

- A. AWI Quality Standard: Comply with applicable requirements of "Architectural Woodwork Quality Standards" published by the Architectural Woodwork Institute (AWI), except as otherwise indicated.
- B. Installer Qualifications: Arrange for installation of architectural woodwork items by same firm which fabricated them.
- C. Industry standards for Architectural Millwork: Quality Standards of Architectural Woodwork Institute (AWI).

**PART 2 - PRODUCTS****2.01 MATERIALS**

- A. General: Provide materials of good quality and suitable for use indicated and complying with reference product standards that apply to products indicated. Panel product shall be flat without bow, twist or warp.
  - 1. Plastic Laminate: NEMA LD-3 of thickness, type and grade designation indicated in colors or patterns and finishes as indicated on drawings or as selected.
  - 2. Particleboard: ANSI A208.1 mat-formed particleboard, Grade 1-M-2 with minimum density of 40 lbs. per cubic foot, internal bond of 60 psi, and minimum screwholding capacity of 225 lbs. on faces and 200 lbs. on edges.
  - 3. Softwood Plywood: PS 1, APA Group 1, Exterior, Grade as indicated.
  - 4. Hardwood Plywood: PS 1-83, 7 ply, APA A-A, Group 2, Exterior, Luan Veneer sanded.
  - 5. Joiner Adhesive: Waterproof, phenol resin, fungus resistant.
  - 6. Trim: clear pine, premium grade
  - 7. Hardwood: clear, premium grade hardwood of any species.
  - 8. Unexposed millwork framing and blocking 2 x 4 nominal and larger: Standard Grade west coast lumber, fire retardant treated.
  - 9. Exposed and semi-exposed painted millwork and trim: Custom Grade White Pine, Fir or Poplar, kiln dried, containing paintable defects.
  - 10. Plastic Laminate Countertops: Type and grade designation indicated in colors or patterns and finishes as indicated on drawings.
  - 11. Manufacturer: Formica



**Construction Specification****INTERIOR ARCHITECTURAL WOODWORK****2.02 SHEET MATERIAL**

- A. Plywood:
  - 1. Unexposed and general carpentry: APA-AC-INT, Group I, fire retardant treated (if required by code)
  - 2. Exposed and Semi-exposed Millwork:
    - a. Painted: Premium, closed grained veneer.
    - b. Stained: Premium, Grade 1, Oak Veneer with grain selected for compatibility with adjacent solid lumber elements.
    - c. Clear Sealer Only: Premium, Grade 1, hardwood.
    - d. Faces: APA-AB-INT.
- B. Plastic: Clear acrylic sheet (as indicated on drawings).

**2.03 FABRICATION, GENERAL**

- A. Wood Moisture Content: Comply with requirements of referenced quality standard for moisture content of lumber at time of fabrication and for relative humidity conditions in the installation areas.
- B. Fabricate woodwork to dimensions, profiles, and details indicated with openings and mortises precut, where possible, to receive hardware and other items and work.
- C. Complete fabrication, assembly, finishing, hardware application, and other work before shipment to project site to maximum extent possible. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
- D. Pre-Cut Openings: Fabricate architectural woodwork with pre-cut openings, where possible, to receive hardware, appliances, plumbing fixtures, electrical work and similar items. Locate openings accurately and use templates and roughing-in diagrams for proper size and shape. Smooth edges of cutoffs and, where located in countertops and similar exposure seal edges of cutouts with water-resistant coating.
- E. Measurements: Before proceeding with fabrication of woodwork required to be fitted to other construction, obtain field measurements and verify dimensions and shop drawing details as required for accurate fit.
  - 1. Where sequence of measuring substrates before fabrication would delay the project, proceed with fabrication (without field measurements) and provide ample borders and edges to allow for subsequent scribing and trimming of woodwork for accurate fit.

**2.04 CABINETS (FBO)**

- A. General construction: Cabinets shall be all wood, jointed and glued construction and meet or exceed ANSI A161.1/1980 with certification in accordance with NKCA specifications. All components of cabinetry shall meet requirements of this Section.
  - 1. Manufacturer:
    - a. Millspride
- B. Members: Cabinetry other than at Training Room and Employee Lounge (if indicated on drawings)
  - 1. Cabinet Face frames are to be solid oak, kiln-dried to 8% moisture content. Minimum 3/4" thickness lumber, mortise and tenon joints glued and stapled, dadoed to receive end, top and bottom panels.
  - 2. End panels: Minimum 3/4" thickness plywood.
  - 3. Back: 3/4" thickness plywood.
  - 4. Drawers: Minimum 1/2" thickness plywood sides and back with hardboard bottom and a tough woodgrain wipe clean finish. Dado bottom into ends and back. Attach back and front using lock shoulder or dovetail, glued and nailed with overlay applied front.
  - 5. Door and drawer fronts: Flush Type doors are 3/4" thickness oak veneer plywood with pressure glued veneer edge banding to match. Drawer fronts are kiln-dried solid oak. All doors and drawer fronts shall be square edge overlay, reveal style.
  - 6. Cabinet bottoms: Minimum 3/4" thickness plywood, dadoed, glued and stapled into front frame and rear hanging rails.
  - 7. Shelves: Minimum 3/4" thickness plywood with 3/4" x 1-1/2" edge nosing.
  - 8. Toe strip: Minimum 3/4" hardwood lumber.
  - 9. Stain: Shop applied. Refer to Section 09900 for stain requirements.
  - 10. All Cabinet and drawer interiors to be birch veneer plywood with clear stain sealer only.
  - 11. Countertops: Plastic laminate over 3/4" plywood, exposed counter edges shall be half round oak wood edge, 1-1/2" deep. Countertop shall be provided and installed by General Contractor.
  - 12. Back and side splashes: Plastic laminate over 3/4" plywood. Align joints with countertop joints. Back and side splashes shall be provided and installed by General Contractor.
  - 13. Lavatory Countertops: Phenolic surface attached to cabinetry, per manufactures requirements. Countertop shall be provided and installed by General Contractor.
- C. Hardware:

**Construction Specification****INTERIOR ARCHITECTURAL WOODWORK**

1. Drawer slides: Stay-closed type with ball-bearing nylon rollers rated for at least 50 lb. per drawer.
2. Hinges: Self-closing semi-concealed type, stain chrome finish.
3. Bumpers: Cork, vinyl, felt or rubber, at each door and drawer.
4. Drawer and Door Pull: Chrome Wire by Epco Builder's Hardware.

**PART 3 - EXECUTION****3.01 PREPARATION**

- A. Condition woodwork to average prevailing humidity conditions in installation areas prior to installing.
- B. Pre-Installation Meeting: Meet at project site prior to delivery of architectural woodwork and review coordination and environmental controls required for proper installation ambient conditioning in areas to receive work. Include in meeting the Contractor; Owner Representative, (if any); Installers of architectural woodwork, wet work such as plastering, other finishes, painting, mechanical work and electrical work; and firms or persons responsible for continued operation (whether temporary or permanent) of HVAC system as required to maintain temperature and humidity conditions. Proceed with woodwork installation only when everyone concerned agrees that required ambient conditions can be maintained.
- C. Prior to installation of architectural woodwork, examine shop fabricated work for completion, and complete work as required, including back priming and removal of packing.
- D. Cabinetry for Training Room and Employee Lounge:
  1. Owners Fixture Contractor to supply and install cabinetry. General Contractor shall supply and install countertop.

**3.02 INSTALLATION**

- A. Install woodwork plumb, level, true and straight with no distortions. Shim as required using concealed shims. Install to a tolerance of 1/8" in 8'-0" for plumb and level (including tops); and with no variations in flushness of adjoining surfaces.
- B. Scribe and cut woodwork to fit adjoining work, and refinish cut surfaces or repair damaged finish at cuts.
- C. Anchor woodwork directly attached to substrates. Secure with countersunk, concealed fasteners as required for a complete installation. Use oval countersunk head fasteners and finishing washers for anchoring fixed base and storage cabinets to substrate.
- D. Cabinets: Install without distortion so that doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete the installation of hardware and accessory items as indicated.
- E. Tops: Anchor securely to base units and other support systems as indicated.

END OF SECTION

**PART 1 - GENERAL****1.01 SUMMARY**

- A. This Section includes furnishing and installation of water repellent coating on exposed exterior masonry units, excluding associated areas of floors and paving.
- B. The extent of surfaces to receive water repellent coating shall include all exterior exposed surfaces of brick and/or concrete masonry units. Concrete masonry units that include integral water repellent shall not require additional coating.

**1.02 RELATED DOCUMENTS**

- A. Related work specified elsewhere includes but may not be limited to:
  - 1. Section 04200 - Brick Masonry (if applicable)
  - 2. Section 04230 - Reinforced Unit Masonry (if applicable)
  - 3. Section 09900 - Painting.

**1.03 QUALITY ASSURANCE**

- A. A firm with not less than three (3) years of successful experience in application of water repellent coatings of type required on substrates similar to those of this project. The firm shall be approved by the manufacturer for installation of their product.
- B. Deliver materials to site in good condition, in original unopened packaging, and with labels intact. Inspect materials upon delivery and replace damaged or contaminated materials.
- C. Store materialist above ground, under cover, in a dry place, and in a manner to prevent damage or staining.
- D. Inspection by manufacturer's representative of subsurface conditions is required. Obtain written approval from representative before proceeding with Work.

**1.04 GUARANTEE**

- A. Contractor shall guarantee entire installation against water penetration for five (5) years from date of Grand Opening.

**PART 2 - PRODUCTS****2.01 WATER REPELLENTS**

- A. Provide products of the following manufacturer. All materials used in the work shall be the product of one manufacturer.
- B. Brick Masonry:
  - 1. Ready-to-use, water-based silane/siloxane low-VOC water repellent
  - 2. Acceptable manufacturers and products:
    - a. Prosoco: Sure Klean Weather Seal Siloxane PD
- C. Concrete masonry surfaces:
  - 1. Concentrated solvent-free blend of silanes and oligomeric alkoxy-siloxanes low-VOC water repellent designed for dilution with fresh water at the job site for application to dense or porous masonry surfaces.
  - 2. Acceptable Products:
    - a. Prosoco: Sure Klean Weather Seal Siloxane WB Concentrated

**2.02 CLEANER**

- A. Brick Cleaner:
  - 1. Concentrated acidic cleaner for new masonry surfaces that are subject to vanadium, manganese and other metallic stains
  - 2. Acceptable Products:
    - a. Prosoco: Sure Klean Vana Trol
- B. Concrete Cleaner:
  - 1. General-purpose, non-etching acidic cleaner for removing common construction and atmospheric staining, rust, mud, oil, and mortar smears from custom masonry and other architectural concrete surfaces.
  - 2. Acceptable Products:
    - a. Prosoco: Sure Klean Burnished Custom Masonry Cleaner

**PART 3 - EXECUTION****3.01 PREPARATION**

- A. Clean substrate of substances that might interfere with penetration and adhesion of coating. Test for moisture content in accordance with coating manufacturer's instructions to ensure that surface is sufficiently dry.
- B. Protect adjoining work, including sealant bond surfaces, from spillage or blow-over of coating. Cover adjoining surfaces where possible.

**3.02 CLEANING**

- A. Brick Cleaner:
  - 1. Before applying, read the Manufacturer's Product Data Sheet.
  - 2. Dilute concentrate with 1-10 parts water. Refer to Product Data Sheet for recommended dilution for intended use.
  - 3. Thoroughly saturate a large portion of the masonry surface with fresh water.
  - 4. Using a densely-packed, soft-fibred masonry-washing brush or low pressure spray (50 psi max), apply diluted solution freely. Do not apply diluted cleaning solution with pressure spray above 50 psi. Such application will drive the chemicals deep into the surface making it difficult to rinse completely.
  - 5. Leave cleaning solution on the wall for about 5 minutes, depending on absorption rate of masonry and drying conditions. Do not let cleaner dry into the masonry. This may leave a residue and cause staining.
  - 6. Reapply cleaning solution and scrape off heavy buildup of excess mortar using a wooden scraper or piece of brick. Take care to avoid damaging the masonry surface. Do not use metal scrapers, which may contribute to metallic staining.
  - 7. Rinse thoroughly with fresh water, removing all cleaning compound, free sand, loose material and debris. Thorough rinsing is extremely important to ensure that all residues are removed from the porous masonry. High-pressure rinsing equipment providing at least 400 psi with 4 to 6 gallons of water per minute will prove most effective.

- B. Concrete Cleaner:

- 1. Before applying, read the Manufacturer's Product Data Sheet.
  - 2. Dilute concentrate with 1-3 parts water. Refer to Product Data Sheet for recommended dilution for intended use.
  - 3. Always prewet surface with fresh water. When cleaning vertical surfaces, keep lower areas wet to avoid streaks.
  - 4. Apply diluted cleaning solution directly to surface with masonry brush or low-pressure spray.
  - 5. Let the cleaner stay on the surface for 3-5 minutes or until stains have disappeared.
  - 6. Reapply cleaner and rinse thoroughly with fresh water to get all residues off the surface. If pressure-rinsing equipment is not available, brush the surface while rinsing with clean water.
  - 7. Multiple applications may etch acid-sensitive surfaces.

**3.03 WATER REPELLENT TREATMENT****A. Brick Application:**

- 1. Application
  - a. Before applying, read the Manufacturer's Product Data Sheet. Refer to the Product Data Sheet for additional information about application. Do not dilute or alter.
  - b. For best results, apply protective treatment "wet-on-wet" to a visibly dry and absorbent surface.
- 2. Alternate Application Methods
  - a. Spray: Saturate from the bottom up, creating a 4" to 8" (15 to 20 cm) rundown below the spray contact point. Let the first application penetrate for 5-10 minutes. Re-saturate. Less will be needed for the second application.
  - b. Brush or roller: Saturate uniformly. Let protective treatment penetrate for 5 to 10 minutes. Brush out heavy runs and drips that don't penetrate.
- 3. Dense Surface Application Instructions
  - a. Apply in a single, saturating application with no run down. Back roll all runs and drips to ensure uniform appearance. DO NOT OVER APPLY. One application is normally enough. Always test.

**B. Concrete Application:**

- 1. Dilute with clean, potable water only. Mixing vessels must be clean, dry and free of contaminants. When added to water, Siloxane WB turns milky white. Mix lightly to produce a uniform consistency.
  - 2. Siloxane WB is most effective when prepared solutions are applied within 8 hours of dilution, and must be applied within 24 hours of dilution.
- 3. Application
  - a. Before applying, read the Manufacturer's Product Data Sheet. Refer to the Product Data Sheet for additional information about application and dilution rates.
  - b. For best results, apply diluted protective treatment "wet-on-wet" to a visibly dry and absorbent surface.
- 4. Alternate Application Methods
  - a. Spray: Saturate from the bottom up, creating a 4" to 8" (15 to 20 cm) rundown below the spray contact point. Let the first application penetrate for 2-3 minutes. Re-saturate. Less material will be needed for the second application.

- b. Brush or roller: Saturate uniformly. Let diluted protective treatment penetrate for 2 to 3 minutes. Brush out heavy runs and drips that do not penetrate.

**3.04 INSPECTION**

- A. Weather and Substrate Conditions: Do not proceed with application of water repellent coating under any of the following conditions:

- 1. When ambient temperature is less than 50°F.
- 2. When substrate surfaces have cured for less than a period of 30 days.
- 3. When rain or temperatures below 40°F are predicted for a period of 24 hours.
- 4. Earlier than 3 days after surfaces become wet from rainfall or other moisture sources.

- B. Installer and manufacturer's representative shall examine the substrate to which the coating is to be applied and report any condition which is detrimental to the application or performance of the coating to the Contractor prior to the start of application. Repair or replace surfaces not meeting tolerances of quality requirements governing substrate construction prior to initiating this work.

**END OF SECTION**

**PART 1 - GENERAL****1.01 SUMMARY**

- A. Extent of insulation work is shown on drawings and indicated by provisions of this section.
- B. Applications of insulation specified in this section include the following:
  - 1. Wall Batt Insulation
  - 2. Roof Batt Insulation (if indicated in drawings)
  - 3. Sound Attenuation Batt Insulation
  - 4. Rigid wall insulation (if indicated in drawings)
  - 5. Rigid under-slab insulation (if indicated in drawings)
- C. Related Work specified elsewhere includes but not limited to:
  - 1. Section 01012: Preferred Purchasing
  - 2. Section 06200: Panelized Roof Systems (if applicable)
  - 3. Section 07534: Single Ply TPO Membrane Roofing for rigid insulation above metal roof deck for TPO roofing (where applicable).
  - 4. Section 07840: Firestopping - for Safing Insulation

**1.02 PREFERRED PURCHASING**

- A. Unless noted otherwise, Contractor and all subcontractors are encouraged to purchase all products listed in this specification section from a local The Home Depot Store. For more information, refer to Section 01012.

**1.02 REFERENCES**

- A. ASTM International Inc. (ASTM):
  - 1. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; **2012**.
  - 2. ASTM C1304 - Standard Test Method for Assessing the Odor Emission of Thermal Insulation Materials.
  - 3. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; **2017**.
  - 4. ASTM E96 - Test Methods for Water Vapor Transmission of Materials.
  - 5. ASTM E119, - Test Methods for Fire Tests of Building Construction and Materials.
  - 6. ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 Degrees C; **2016a**.

**1.03 PRODUCT HANDLING**

- A. Delivery and Storage: Keep materials under cover and dry. Protect against exposure to weather and contact with damp or wet surfaces.

**PART 2 - PRODUCTS****2.01 INSULATING MATERIALS**

- A. General: Provide insulating materials that comply with requirements indicated for materials, compliance with referenced standards, and other characteristics.
  - 1. Preformed Units: Sizes to fit applications indicated, selected from manufacturer's standard thickness, widths and lengths.

**2.02 WALL AND CEILING BATT INSULATION**

- A. Foil Faced Flame Resistant Insulation:
  - 1. Type: FRK (foil) faced glass fiber thermal insulation complying with ASTM C665, Type III, Class A.
  - 2. Provide R-value as specified in drawings
  - 3. Vapor Retarder Perm Rating: PSK facing Perms Maximum 0.10 when tested in accordance with ASTM E 96.
  - 4. Surface Burning Characteristics for FRK and PSK faced product (when tested in accordance with ASTM E 84):
    - a. Maximum flame spread: 25
    - b. Maximum smoke developed: 50
  - 5. Combustion Characteristics: Classified non-combustible by model building codes. Not required to be covered. May be left exposed. To comply with ASTM E136.
  - 6. Dimensional Stability: Linear shrinkage less than 0.1%
  - 7. Odor Emission: To comply with ASTM C1304.
  - 8. Manufacturers:
    - a. Owens Corning: Flame Spread 25 Foil Faced Fiber Glass Batt Insulation

**2.03 ROOF BATT INSULATION (if indicated in drawings):**

A. White Foil Faced Flame Resistant Insulation system:

1. Type: PSK (white) faced glass fiber thermal insulation complying with ASTM C665, Type III, Class A.
2. Provide R-value as specified in drawings
3. Vapor Retarder Perm Rating: PSK facing Perms Maximum 0.10 when tested in accordance with ASTM E 96.
4. Surface Burning Characteristics for FRK and PSK faced product (when tested in accordance with ASTM E 84):
  - a. Maximum flame spread: 25
  - b. Maximum smoke developed: 50
5. Combustion Characteristics: Classified non-combustible by model building codes. Not required to be covered. May be left exposed. To comply with ASTM E136.
6. Dimensional Stability: Linear shrinkage less than 0.1%
7. Odor Emission: To comply with ASTM C1304.
8. Manufacturers:
  - a. Owens-Corning: PSK-Faced Flame Spread 25 Fiber Glass Batt Insulation

**2.04 SOUND ATTENUATION BATT INSULATION**

A. Unfaced Sound Attenuation Fiberglass Batts

1. Type: Unfaced glass fiber acoustical insulation complying with ASTM C 665, Type I.
2. 2 ¾" Thick
3. Surface Burning Characteristics (When tested in accordance with ASTM E 84):
  - a. Maximum flame spread: 10
  - b. Maximum smoke developed: 10
4. Combustion Characteristics: To comply with ASTM E 136.
5. Fire Resistance Ratings: To comply with ASTM E 119 as part of a complete fire tested wall assembly.
6. Dimensional Stability: Linear Shrinkage less than 0.1%
7. Manufacturers:
  - a. Owens Corning: Sound Attenuation Batts Fiber Glass
  - b. Roxul: Safe 'n' Sound Stone Wool Insulation

**2.05 RIGID WALL INSULATION (if indicated in drawings)**

A. Interior Tilt-wall Finish Board Insulation: Glass fiber reinforced polyisocyanurate foam core faced with nominal 16.5 mil embossed white acrylic-coated aluminum sheet laminated one side, 1.0 mil plain aluminum opposite side. R-value as indicated on drawings

1. Manufacturer:
  - a. The Dow Chemical Company: Thermax Heavy Duty Plus Insulation

B. Joint Closure System: PVC Interlock installation components per manufacturers recommendations. Concrete Wall direct application: Attach female portion of system to concrete wall through holes provided at 12 inches on center with Bostich Pneumatic nail system or equal. Apply beads of construction adhesive to the concrete wall at 16 inches on center between the PVC strips. Press board firmly into position between the female PVC strips. Apply a continuous bead of sealant along the face of boards next to the joint. Insert the male PVC closure strip into the female slots to secure the boards.

1. Manufacturer:
  - a. The Dow Chemical Company: Thermax Joint Closure System

**2.06 RIGID CEILING INSULATION (if indicated in drawings)**

A. Interior Ceiling Finish Board Insulation: Glass fiber reinforced polyisocyanurate foam core faced with nominal 16.5 mil embossed white acrylic-coated aluminum sheet laminated one side, 1.0 mil plain aluminum opposite side. R-value as indicated on drawings

1. Manufacturer:
  - a. The Dow Chemical Company: Thermax Heavy Duty Insulation

B. Joint Closure System: PVC Interlock installation components per manufacturers recommendations. Concrete Wall direct application: Attach female portion of system to concrete wall through holes provided at 12 inches on center with Bostich Pneumatic nail system or equal. Apply beads of construction adhesive to the concrete wall at 16 inches on center between the PVC strips. Press board firmly into position between the female PVC strips. Apply a continuous bead of sealant along the face of boards next to the joint. Insert the male PVC closure strip into the female slots to secure the boards.

1. Manufacturer:
  - a. The Dow Chemical Company: Thermax Joint Closure System

**2.07 RIGID UNDER-SLAB INSULATION (if indicated in drawings)**

A. High Compressive Strength Rigid Foam Insulation

1. Type: Extruded polystyrene insulation complying with ASTM C 578, Type V.
2. Where indicated on the drawings use 2" (min) extruded Polystyrene insulation. Install as shown in drawings and in accordance to manufacturers instructions including all accessories and adhesives as recommended.
3. Manufacturer:
  - a. The Dow Chemical Company: Styrofoam Highload 100
  - b. Owens Corning: Foamular 1000

## 2.08 INSULATION ACCESSORIES

- A. Mechanical Anchors: Type and size indicated or, if not indicated as recommended by insulation manufacturer for type of application and condition of substrate.
- B. Insulation Mastic Tape: As recommended by insulation manufacturer for securing batts to surfaces shown on drawings. Flame spread index shall be 25 or less, smoke developed index of 50 or less.

## PART 3 - EXECUTION

### 3.01 INSPECTION AND PREPARATION

- A. Require Installer to examine substrates and conditions under which insulation work is to be performed. A satisfactory substrate is one that complies with requirements of the section in which substrate and related work is specified. Obtain Installer's written report listing conditions detrimental to performance of work in this section. Do not proceed with installation of insulation until unsatisfactory conditions have been corrected.
- B. Clean substrates of substances harmful to insulations or vapor retarders, including removal of projections that might puncture vapor retarders.

### 3.02 INSTALLATION, GENERAL

- A. Comply with manufacturer's instructions for particular conditions of installation in each case. If printed instructions are not available or do not apply to project conditions, consult manufacturer's technical representative for specific recommendations before proceeding with work.
- B. Extend insulation full thickness as shown over entire area to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation. Remove projections that interfere with placement.
- C. Apply a single layer of insulation of required thickness, unless otherwise shown or required to make up total thickness.
- D. Apply insulation units to substrate by method indicated, complying with manufacturer's recommendations. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.

### 3.03 PROTECTION

- A. General: Protect installed insulation from possible physical abuses, where possible by non-delayed installation of concealing work or, where that is not possible, by temporary covering or enclosure.

END OF SECTION



**Construction Specification****EXTERIOR INSULATION AND FINISH SYSTEMS****PART 1 - GENERAL****1.01 SUMMARY**

- A. This specification describes a 100% polymer based exterior insulation finish system (EIFS) designed for exterior walls and canopy. The general conditions and general requirements of these construction documents apply to the general contractor, subcontractors, material suppliers and all other persons furnishing labor and materials under this section.

**1.02 DESCRIPTION**

- A. Design requirements include: the structural wall system to which the EIFS is attached shall meet L/240 maximum allowable deflection criteria and applicable building code requirements.

**1.03 DELIVERY, STORAGE AND HANDLING**

- A. All EIFS materials shall be delivered in their original sealed containers bearing manufacturer's name and identification of product with written application instruction and appropriate health hazard and safety data.
- B. All EIFS ready mixed materials shall be protected from extreme heat, sun and frost. Factory proportioned bagged materials shall be stored off the ground and protected from moisture.

**1.04 JOB CONDITIONS**

- A. All EIFS materials shall never be applied if ambient and surface temperature cannot be kept above 38 degrees Fahrenheit during application and drying period. For installation in temperatures less than 38 degrees Fahrenheit supplementary heat shall be provided. The installed EIFS materials shall be protected from exposure to rain and freezing until dry.

**1.05 WARRANTY**

- A. Manufacturer shall provide a written warranty for materials and installation to be free from defects for a period of five (5) years.

**1.06 EIFS CODE COMPLIANCE**

- A. The EIFS shall be recognized by the following Model Building Code Organizations as described in the current versions of the documents:
1. BOCA Research Report No. 89-63.
- B. The EIFS shall be approved for use on this project by the applicable state and/or building code authorities.
- C. The EIFS shall have been issued an approval as described in the current applicable HUD materials release.
- D. The EIFS shall meet criteria set forth in the Health and Human Services Technical Bulletin No. 30.
- E. The EIFS shall be approved by Factory Mutual Research Corporation and listed in the FM Approval Guide.

**1.07 SUBMITTALS TO ARCHITECT OF RECORD**

- A. Submit manufacturers color and texture samples to match colors indicated on drawings.
- B. Shop drawings detailing fabrication and erections of each fabrication indicated. Include plans, elevations, sections, and details of fabrications and their connections. Show anchorage and accessory items. Provide templates for anchors specified for installation.

**PART 2 - PRODUCTS****2.01 MATERIALS - GENERAL**

- A. Manufacturers: materials are specified by brand names to establish a standard quality, or by performance requirements and general description of product. The architect reserves the right to reject any material which, in his opinion, will not produce the quality of work specified herein.
- B. The following are acceptable manufacturers:
1. Dryvit: Outulation Plus MD System
  2. Senergy: Seneflex Channeled Adhesive Design
  3. SonoWall: FlexWall WM System
  4. Sto Corporation: StoTherm Classic NEXT

**2.02 ADHESIVE**

**Construction Specification****EXTERIOR INSULATION AND FINISH SYSTEMS**

- A. Utilize manufacturer's adhesive applied in a vertical notched trowel configuration.

**2.03 INSULATION BOARD**

- A. Expanded Polystyrene Insulation Board with less than 25 flame spread, 1.0 lb/cu. ft. nominal density, U=0.25 per inch; **ASTM C 578-17a Type I**.
- B. Dimensional tolerances shall be as follows: Edges shall be square within 1/16 inch over the entire length of the board. Thickness shall be plus or minus 1/16 inch.
- C. Thickness shall be indicated on drawings, minimum 3/4 inch.
- D. EPS Board shall be aged by air-drying for a minimum of six weeks or equivalent kiln dried.
- E. Maximum size EPS Boards shall not exceed 2' x 4'.
- F. EPS Board shall exhibit proper bead fusion and structural strength.

**2.04 GROUND COAT**

- A. A factory blended 100% acrylic (non-cementitious)\_base coat.

**2.05 REINFORCING MESH**

- A. Standard Mesh: Symmetrical, interlaced glass fiber made from twisted multi-end strands and alkaline resistant coating, at least 20 grams per square yard. The mesh shall be shift proof, with trimmed roll edges to minimize building on overlapped seams.
- B. Corner Mat: A pre-creased, heavy-duty woven glass fiber mesh with alkaline resistant coating, used for maximum impact protection at corners.

- C. Armor Mat: A specially developed high impact, double strand, interwoven glass fiber mesh with alkaline resistant coating.

**2.06 PRIMER**

- A. Acrylic Primer: An acrylic copolymer emulsion primer for acrylic-based finishes or silicone emulsion primer for silicone based finishes.

**2.07 FINISH**

- A. The finish shall be an exterior ready mixed wall coating. Type, texture, color and aggregate size shall be as indicated on drawings, or per approved sample submittal.
- B. Color Selection: The lightness value of the exterior finish color to be applied over the insulation board shall be 20 percent or greater.

**PART 3 - EXECUTION****3.01 INSTALLATION**

- A. All installation shall be performed by and/or supervised by trained applicators.
- B. Under no circumstances shall any of the products be altered by adding any additives, except for small amounts of clean water as directed on label. Antifreeze, accelerators, rapid binders, etc. are forbidden.
- C. The surfaces to receive the EIFS shall be structurally sound, clean and dry, and free of warp age, residual moisture or damage from moisture. Surfaces shall be uniform, with no irregularities greater than 1/8 inch in 4'-0". Surfaces shall be inspected for compliance with installation of the EIFS:
1. Gypsum sheathing shall meet the requirements of ASTM C-70 and shall be handled, installed, and protected in accordance with Gypsum Association standards and manufacturers requirements.
  2. Concrete, masonry or plaster surfaces shall be properly cured and free of dirt, dust, oil, grease, mildew, fungus, laitance, efflorescence and any other contaminant.
- D. After satisfactory inspection of surfaces and corrections of any deviations from specification requirements, the EIFS installation may begin.
- E. Material to be installed where shown on drawings and in accordance with the manufacturer's latest written instructions.

**3.02 JOB SITE CLEANUP**

- A. All excess wall system materials shall be removed from the job site by the contractor in accordance with contract provisions.

**Construction Specification**

**EXTERIOR INSULATION AND FINISH SYSTEMS**

- B. All surrounding areas, where the EIFS has been applied, shall be left free of debris and foreign substances.

END OF SECTION

**Construction Specification****METAL ROOF AND WALL PANELS****PART 1 - GENERAL****1.01 SUMMARY**

A. Metal roof and wall panels, translucent panels, flashings, closures and accessories as required for a complete job are included in this Section.

B. Related Work

1. Section 09900 - Painting

**1.02 SUBMITTALS TO ARCHITECT OF RECORD**

A. Shop Drawings: Indicate sizes, shapes, thickness and types of materials, finishes, fabrication details, anchors, connections, expansion joints and relation to adjacent work. Drawings shall be drawing to 1" = 1'-0" or larger scale.

B. Engineering calculations: Submit calculations for each item and accessory based on the performance standards listed in the Quality Assurance Section.

C. Samples: Submit three (3) 12" square samples of the specified metal and finish to be used as metal roofing. Samples shall be reviewed by the Architect of Record for color and texture only.

**1.03 DELIVERY, STORAGE AND HANDLING**

A. Store materials off ground, under cover. Protect from damage or deterioration.

B. Handle materials to prevent damage to surface, edges, ends and factory applied finishes of items. Damaged material shall be rejected and replaced.

**1.04 INSPECTION**

A. Examine surfaces designated to receive work described in this Section for conditions adversely affecting the finished work. Repair or replace surfaces not meeting tolerances or quality requirements imposed within specifications governing substrate construction prior to initiating this work.

**1.05 QUALITY ASSURANCE**

A. Performance Standards:

1. Wind Uplift: The roof system manufacturer shall provide an attachment schedule signed by a Professional Engineer licensed in the area the work will be performed and supporting calculations to resist the following uplift loads: Uplift loads as calculated using data indicated on roof plan drawing.
2. Snow guard installation (if indicated on drawings) shall withstand applicable snow loading conditions to meet applicable codes without shear or bond failure.
3. Deflection shall not exceed L/180.
4. All primer and painting products furnished in this section shall be VOC compliant for building location.

**PART 2 - PRODUCTS****2.01 METAL ROOF AND WALL PANELS**

A. Approved Manufacturers:

1. AEP-Span, 2110 Enterprise Blvd., West Sacramento, CA 95691  
Contact: [Bill Adams, Phone: 1-800-726-2727](tel:18007262727) ([Lee Stanton 509-499-8269](tel:9165094998269))  
Panel profile: 7.2" x 1.5", HR-36
2. Berridge Manufacturing Company, 6515 Fratt Rd., San Antonio, TX 78218  
Contact: Becky Wynn, Phone: 1-800-669-0009  
Panel profile: 7.2" x 1.5", Deep-Deck
3. Components Plus, 460 Clay Rd., Sunnyvale TX 75182  
Contact: [Bob Bollini, Phone: 1-888-929-2194](tel:18889292194) ([Non-working number. Web search located McElroy Metal at Components Plus location. ????](#))  
Panel profile: 7.2" x 1.5", Max
4. Fabral, 3449 Hepland Rd, Lancaster, PA 17601, Phone: 1-717-397-2741  
Panel profile: 7.2" x 1.5", Hefti-Rib
5. McElroy Metal Inc., 555 Divided Dr. Peachtree City, GA 30269  
Contact: [Mark Lawson, Phone: 1-800-950-6531](tel:18009506531)  
([Verify if Atlanta local contact is preferred: Craig Anderson 318-747-8086](#))  
Panel profile: Mega-Rib

**Construction Specification****METAL ROOF AND WALL PANELS****B. Metal Panel designation: HR-36**

1. Base metal
  - a. Material: Steel.
  - b. Manufacturing Standard: ASTM A-446, Grade C.
  - c. Minimum yield strength: 40,000 psi.
  - d. Thickness: 24 gauge U.N.O. Triple Span Criteria.
  - e. Protective coating: Zincalume; ASTM A-792-83
  - f. Protective coating components by weight:
    - i. Zinc = 45%
    - ii. Aluminum Alloy = 55%
  - g. Protective coating thickness: 1.9 mils
2. Configuration
  - a. Pattern: corrugated
  - b. Corrugation spacing: 7.2 inches o.c.
  - c. Corrugation height: 1-1/2" inches
  - d. Nominal panel width: 36 inches
  - e. Panel length: as shown on drawings.
3. Top and Bottom Color/Finish:
  - a. White factory backer coat.
  - b. Pre-finished colors: Review drawings for Kynar-500 coating colors. Color equivalencies shall be based on manufacturer's standard colors unless otherwise noted.
  - c. All panels are to be pre-finished (exposed sides) to limit field painting.
  - d. Touch up with matching color as required. Refer to Painting specification.

**2.02 TRANSLUCENT PANELS****A. Approved Manufacturers**

1. Enduro Composite Systems, Houston, TX. Phone: (800) 231-7271 or Fax: (713) 869-4907.  
Panel: Tuff Span PFR 300  
Color: Standard White
2. Kemlite Company, Inc., Grand Junction, TN 38039. Phone (800) 238-6874, Fax (731) 764-6316  
Panel: ISO-TUFF  
Color: White (405)
3. Resolite, Zellenople, Pennsylvania, (724) 452-6800, Fax (724) 452-0677.  
Panel: Fire Snuf 25A (FSS25A), Type 1230-HD  
Color: No. 31 White

**B. Material**

1. Glass reinforced equal or greater than 25%
2. Resin: Light stabilized fire retardant polyester, 75% by weight and modified by acrylic modification and neo-pentyl glycol additive
3. Manufacturing standard: Panel classified by Underwriter's Laboratory Inc. With a flame spread of 25
4. Finish shall be embossed
5. Weight: 12 oz. per square foot with a maximum tolerance of +/- 5%.

**C. Configuration**

1. Pattern: corrugated.
2. Corrugation spacing: 7.2 inches o.c.
3. Corrugation height: 1 ½ inches.
4. Nominal panel width: 36 inches.
5. Panel length: as shown on drawings.

**2.03 ACCESSORIES**

- A. Flashing: All flashing connected to metal roof system shall be provided of same gauge and finish as adjoining panels.
- B. Fasteners: Sufficient fasteners shall be provided of the size, type and holding strength required for proper erection according to manufacturer's standards and engineering requirements. Color on fasteners shall match panel color.
  1. Fasteners shall be "ZAC" screws by Construction Fasteners and/or #305 self-drilling stainless steel screws. Both types shall have sealing washers. Screw/Washer system shall be used for entire roof fastening.
- C. Contour Closure: At top of the roof panels provide rubber contour closure. Rubber closures shall be composed of closed cell black synthetic rubber, furnished with caulk tape for top and bottom for field application.
- D. Caulking: Field applied manufacturer's recommended caulking.

**Construction Specification****METAL ROOF AND WALL PANELS**

1. On roof slopes less than 1:12, use continuous tape sealant at all side laps with side lap fastened with #14 "Lap Tek" self-drilling screws at 16" o.c. and with sealing washers.

E. Snowguards (if indicated on drawings):

1. Approved Manufacturers:
  - a. Model #15 as manufactured by Zaleski Snow Guards, Inc., 11 Alden Street, New Britain, CT 06053, (860)222-1614. Snow guards shall be supplied without the backer, self adhering film. Adhesive shall be Everseal Surebond SB-190.
  - b. Sno-Gem Jr., snow guards as manufactured by Sno-Gem, Inc., McHenry, IL. Phone (888) 766-4367.

**PART 3 - EXECUTION****3.01 INSTALLATION**

- A. Install metal roofing and accessories in accordance with approved shop drawings and manufacturer's printed instructions.
- B. Isolate dissimilar materials by separating with bituminous paint or caulking tape. Protect prefinished surfaces from damage or disfiguration.
- C. At completion of work, touch up minor scratches to prefinished surfaces to the satisfaction of the Architect of Record. Replace panels damaged or stained during erection.
- D. Access to roof after panels have been placed will be done on padded walk boards. Extreme care will be taken to avoid damage to roof. Translucent panels are not designed as a walking surface. always use a roof ladder or plank supported by two or more purlins.
- E. Install snowguards (where shown on the drawings) using adhesive mounting. Do not use screws to penetrate the metal roof. Apply bead of sealant around snow guards.
  1. Layout snowguards in a staggered pattern per manufacturer's instructions following straight lines parallel to the roof edge. Guards shall be installed square to the roof edge.
  2. Install snowguards when outdoor daytime temperature is expected to be 50°F for 30 days prior to forecasted snowfall to allow full curing.

**END OF SECTION**

**PART 1 - GENERAL****1.01 SUMMARY**

- A. Furnish and install brick veneer fiber cement panels where shown on drawings or specified herein
- B. Related Work specified elsewhere includes but not limited to:
  - 1. Division 06 - Wood and plastics.
  - 2. Section 07201 – Building Insulation
  - 3. Section 07901 – Joint Sealers/Fillers

**1.02 REFERENCES**

- A. Unless otherwise shown or specified, this work shall conform to the following standards:
  - 1. ASTM C1185, Standard Test Methods for Sampling and Testing Non-Asbestos Fiber Cement Flat Sheet, Roofing and Siding, Shingles and Clapboards
  - 2. ASTM E228, Standard Test Method for Linear Thermal Expansion of Solid Materials with a Vitreous Silica Dilatometer.
  - 3. ASTM G23, Standard Practice for Operating Light-Exposure Apparatus (Carbon-Arc Type) with and without Water for Exposure of Nonmetallic Materials, Replaced by G152 and G153.
  - 4. ASTM330, Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
  - 5. ASTM331, Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
  - 6. ASTM E119, Standard Test Methods for Fire Tests of Building Construction and Materials.
  - 7. ASTM C518, Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
  - 8. UL-723 Standard Underwriters Laboratories Inc. for Test for Surface Burning Characteristics of Building Materials.

**1.03 COMPLIANCE**

- A. Fiber cement panels shall meet or exceed requirement of the following
  - 1. ICC Evaluation Service, Inc. (ICC-ES) Evaluation Report No. ESR-1694.
  - 2. ICC-ES Legacy Report No. 5915.
  - 3. Canadian Construction Materials Centre (CCMC) Evaluation Report No. CCMC 13083-R.
  - 4. Refer to applicable building code compliance reports for the uniform wind load.

**1.04 SUBMITTALS TO CONTRACTOR**

- A. Drawings: Submit detailed drawings showing installation details.
- B. Product Data: Submit manufacturer's product description, indicating material types and thicknesses, and installation details.
- C. Samples: Submit samples of each product type proposed for use.
- D. Certificates: Submit documents certifying that products meet or exceed requirements

**1.05 QUALITY ASSURANCE**

- A. Performance requirements: Panels are fiber cement panel products with the following typical properties:
  - 1. Linear Variation with Change in Moisture Content: M.D.: -0.006 in./ft., C.D.: 0.003 in./ft.
  - 2. Wet Flexural Strength: Avg. 1155.51 psi.
  - 3. Water Tightness: No water droplets were observed on any specimen.
  - 4. Freeze-thaw: No damage or defects were observed.
  - 5. Warm Water: No evidence of cracking, delamination, swelling, or other defects were observed.
  - 6. Heat-Rain: No crazing, cracking, or other deleterious effects, surface or joint changes were observed in any specimen.
  - 7. Mean Coefficient of Linear Thermal Expansion: Avg.  $3.18 \times 10^{-6}$  in./in. F.
  - 8. Surface Burning: Flame Spread: 0, Smoke Developed: 5.
  - 9. Wind Load: Refer to ESR 1694 for specific design pressures.
  - 10. Water Penetration: No water leakage was observed into wall cavity.
  - 11. Weather Resistant: No cracking, checking, crazing, erosion, or other detrimental effects were observed.
  - 12. Steady-State heat flux and thermal Transmission Properties Test: the test results show that the Fiber Cement Panels to have a thermal resistance of R Value of 1.23 F.
  - 13. Fire Resistant: The walls successfully endured a 60-minute fire exposure without developing excessive unexposed surface temperature or allowing flaming on the unexposed side of the assembly.

**Construction Specification****FIBER CEMENT PANELS****1.06 WARRANTY**

1. Provide manufacturer's 50-year warranty against manufactured defects in fiber cement panels
2. Provide manufacturer's 15-year warranty against manufactured defects in panel finish
3. Warranty provides for the original purchaser. See warranty for detailed information on terms, conditions and limitations.

**PART 2 - PRODUCTS****2.01 MANUFACTURER**

1. Nichiha USA, Inc., 6659 Peachtree Industrial Blvd., Suite AA, Norcross, GA 30092, Toll free: 1.866.424.4421, Office: 770.805.9466, Fax: 770.805.9467, www.NICHIHA.com.

**2.02 MATERIALS**

- A. Fiber cement Brick panels are based on autoclaved, wood fiber reinforced cement panels. Wood fiber bundles are prepared in accordance with manufacturer's specifications, are mixed with Portland cement and silica, etc.
- B. The panels are nominally 1.5 feet in width and 10 feet in length; actually 455mm in height and 3,030mm in length.
- C. The panel's surface is pre-finished and machine applied.
- D. The panels are profiled along all four edges, such that both horizontal and vertical joints between the installed panels are shipped lapped.
- E. A factory-applied sealant is applied to panel edges, such that all joints will contain a factory sealant.

**2.03 PRODUCT DESCRIPTION**

- A. Nichiha – VintageBrick
  1. Profile colors: Alexandria Buff, White Wash
  2. Accessories: Corners for each profile color.
  3. Dimensions: Nominal - 18" (h) x 6' (l) x 3/4" (t); Actual - 455mm (h) x 1,818mm (l) x 18mm (t).
  4. Weight: 39.3 lbs. per panel.
  5. Coverage: 9 sq. ft. per panel.
  6. Factory sealed on six [6] sides.

**2.04 ACCESSORIES AND INSTALLATION COMPONENTS**

- A. Always use manufacturer's accessories for complete and proper installation, whether or not specifically shown on installation drawings.
- B. Additional accessories for installation and designer aesthetics are available. Consult catalog or contact Nichiha USA Inc., for further details.

**PART 3 - EXECUTION****3.01 HANDLING**

- A. Panels must be stored flat and kept dry before instantiation. A weatherproof cover over panels and accessories should be used at all times prior to installation.
- B. If panels are exposed to water or water vapor prior to installation, allow to completely dry before installing. Failure to do so may result in shrinkage at ship lap joints, and such action may void warranty.
- C. Panels MUST be carried on edge. Do not carry or lift panels flat. Improper handling may cause cracking or panel damage. Manufacturer is not responsible for damage caused by improper handling.
- D. Direct contact between the panels and the ground should be avoided at all times. It is necessary to keep panels clean during installation process.

**3.02 JOB CONDITIONS**

- A. Fiber cement panels can be installed over braced wood, steel studs and sheathing including; over Structural Insulated Panels (SIP's), Concrete Masonry Units (CMU's), and Concrete Block Structures (CBS's) with furring strips, and Pre-Engineered Metal Construction.
- B. Allowable stud spacing: See manufacturer's installation instructions for details.
- C. Exterior installation:



1. A weather resistive barrier is required when installing fiber cement panels. Use an approved weather resistive barrier (WRB) as defined by the IRC. Refer to local building codes. Manufacturer is not responsible for water infiltration.
2. Appropriate metal flashing should be used to prevent moisture penetration around all doors, windows, wall bottoms, material transitions and penetrations. Please refer to local building codes for best practices.

**3.03 SURFACE CONDITIONS**

- A. Examine site to ensure substrate conditions are within specification for proper installation.
- B. Do not begin installation until unacceptable conditions have been corrected

**3.04 CUTTING**

- A. Always cut panels outside or in a well ventilated area. Do not cut the products in and enclosed area.
- B. Always wear safety glasses and NIOSH/OSHA approved respirator, whenever cutting, drilling, sawing, sanding or abrading the products. Refer to manufacturer MSDS for more information.
- C. Use a dust-reducing circular saw with a diamond-tipped or carbide-tipped blade, for general cuttings. Recommended circular saw: Makita 7-1/4" Circular Saw with Dust Collector (#5057KB). Recommended blade: Tenryu Board-Pro Plus PCD Blade (#BP-18505). Shears (electric or pneumatic) or jig saw can be used for complicated cuttings, such as service openings, curves, radii and scrollwork.
- D. Silica Dust Warning: NICHHA products may contain some amounts of crystalline silica [a.k.a. sand, silicon dioxide], which is a naturally occurring mineral. The amount will vary from product to product. Inhalation of crystalline silica into the lungs and repeated exposure to silica can cause health disorders, such as silicosis, lung cancer, or death depending upon various factors. To be conservative, manufacturer recommends that whenever cutting, sawing, sanding, sniping or abrading the product, users observe the Safety Instructions above. For further information or questions, please consult the MSDS, your employer, or visit [www.osha.gov/SLTC/silicacrystalline/index.html](http://www.osha.gov/SLTC/silicacrystalline/index.html) and [www.cdc.gov/niosh/topics/silica](http://www.cdc.gov/niosh/topics/silica). The MSDS for the products are available from the manufacturer. FAILURE TO ADHERE TO OUR WARNINGS, MSDS, AND OTHER INSTRUCTION MAY LEAD TO SERIOUS PERSONAL INJURY OR DEATH.

**3.05 FASTENING**

- A. Corrosion resistant fasteners, such as hot-dipped galvanized nails and screws that are appropriate to local building codes and practices must be used. Stainless Steel fasteners are highly recommended in high humidity and high-moisture regions. Manufacturer is not liable for corrosion resistance of fasteners. Do not use aluminum fasteners, staples, clipped head nails or fasteners that are not rated or designed for intended use. See manufacturer's detailed instructions for appropriate fasteners for construction method used.

**END OF SECTION**

**Construction Specification****(FBO) SINGLE PLY TPO MEMBRANE ROOFING****PART 1 - GENERAL****1.01 SUMMARY**

- A. This section covers single ply mechanically attached membrane roofing and related items necessary to complete work on drawings and specified herein.
- B. The following types of work are specified, but not limited to:
  - 1. Thermoplastic Polyolefin (TPO) Sheet Roofing System
  - 2. Rigid insulation
  - 3. Insulation fasteners
  - 4. Tapered Insulation
  - 5. Flashing materials
  - 6. Protective pads
  - 7. Pourable sealer
  - 8. Adhesive and sealants
- C. Related work specified elsewhere:
  - 1. Section 01010 - Furnished By Owner Items (FBO)
  - 2. Section 07600 - Flashing and Sheet Metal
  - 3. Section 07701 - Roof Accessories

**1.02 REFERENCES**

- A. Standard Reference: The NRCA Roofing and Waterproofing Manual published by the National Roofing Contractors Association, latest edition.
- B. Regulatory Requirements:
  - 1. Factory Mutual Research Corporation (FM): Roof covering must conform with FMRC Approval Standard 4470, dated **June 2012**, with supplements, and meet Class 1 approval requirements to resist wind, hail, leakage, corrosion, ultraviolet weathering and expected foot traffic. A copy of the roofing manufacturer's FM Approval Report showing compliance with FM 4470, dated **June 2012**, with supplements, shall be on file with the Architect of Record and/or Owner prior to acceptance of bid. FM wind uplift classification, UL Class 1 and all other manufacturer or regulatory requirements shall be as indicated on drawings.

**1.03 GENERAL**

- A. Final Payment: Upon completion of the punch list items and with written acknowledgement of such completion by the Independent Testing Company and/or the assignment of such acknowledgement by the Home Depot Project Manager (i.e. General Contractor, Architect of Record or Roofing Inspector) that all items are completed the final payment will be submitted. To assure all punch list items are complete to Home Depot's satisfaction, final applications for payment will be accompanied with a signed punch list, Material and Operational information and all Warranties and Guarantees.
- B. Defined Terms: Roofing System Manufacturer - will refer to the responsibility of North American Roofing Systems as it relates to their ability to private label specific types of materials used in the roofing application for each project and thus be referred to and represent all aspects of the Manufacturer of the Roofing Materials. Roofing System Installer - will refer to the installation crew and all associated labor required to apply and install the specified roofing materials defined herein and as provided by North American Roofing Systems.
- C. The Roofing Systems Manufacturer will maintain contact with the General Contractor to insure compliance with the installation schedule.
- D. The General Contractor will provide access to an appropriate clean dry staging areas as required adjacent to the building for material delivery, off loading and storage.
- E. The General Contractor will insure that all related construction components and the entire deck area has been completed and inspected and is available for installation prior to requesting the roofing installation to insure an uninterrupted installation.
- F. A pre-roofing installation meeting will be required as described in Section 07534 **1.08A**
- G. The Roofing Systems Installer will provide fulltime on site supervision to insure specified installation and completion.
- H. The General Contractor will be responsible for coordinating downspout installation from the 2'-0" supplied gutter drop into the sub grade piping.
  - 1. All wood nailers to be provided and installed by others.

**Construction Specification****(FBO) SINGLE PLY TPO MEMBRANE ROOFING****1.04 FBO PROCEDURES**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section. General requirements related to Furnished by Owner (FBO) Items are as defined in Section 01010. All FBO Forms listed below are included as part of Section 01010.
- B. Vendor Contact: Contractor shall send a completed "FBO Form A: Contractor Information Form" to the FBO vendor indicated below, twelve (12) weeks prior to the scheduled installation of the specified system:  
  
North American Roofing Systems, Inc.  
Contact: Jeff Sherrill or Carson Thomas  
Phone: (800) 551-5602  
Fax: (none)  
E-mail: jsherrill@naroofing.com or cthomas@naroofing.com
- C. Take-Offs: FBO Vendor shall provide "take-offs" to the Contractor as specified in Section 01010. The Contractor shall then verify this "take-off" using an "FBO Form B: Take Off Conformation Sheet".
- D. Receipt of Shipment: Contractor shall verify shipment per the requirements of Section 01010 and complete the "FBO Form C: Confirmation of Shipment" and submit back to the FBO vendor.
- E. Request for Changes: Changes to materials and quantities after receipt of shipment shall be coordinated by the contractor with the FBO vendor per the requirements of Section 01010 using an "FBO Form D: Request For Additional/Replacement Materials".
- F. Return Merchandise Authorization Policy: The Home Depot will add to the contractors' scope of work the responsibility for coordinating (1) customer accommodation return request through the FBO Vendor. Requests shall be submitted using the "FBO Form E: Returned Materials" as specified in Section 01010.

**1.05 SUBMITTALS TO CONTRACTOR**

- A. The Roofing System Installer shall submit a letter stating that he has reviewed all conditions of installation and installation details and that installation is in compliance with manufacturer's UL and FM recommendations. Also that all materials used for the roof installation are acceptable to the roofing manufacturer.
- B. Submit shop drawings of all fabricated items for review prior to their fabrication and installation. Items requiring reviewed shop drawings are metal edges, expansion joints, flashing installation, roof drains, relief vent flashing, skylights, smoke vents and roof curbs and all other roof penetrations. Submit roof plan showing membrane layout, splice locations, roof walkway pad locations, all penetrations, detail locations, etc. for a full and complete installations, including any additional fastening requirements for UL and FM ratings.
- C. The Roofing System Installer shall submit a letter stating that he has reviewed all conditions of installation and installation details and that installation is in compliance with manufacturer's UL and FM recommendations. Also that all materials used for the roof installation are acceptable to the roofing manufacturer.

**1.06 QUALITY ASSURANCE**

- A. Apply roofing system using a Roofing System Installer authorized by the Roofing System Manufacturer.
- B. Roofing system shall be classified by Underwriters Laboratories as a Class A sheathing material for use in construction of Class A roofing assemblies.
- C. Inspection: Upon completion of the installation, an inspection shall be made by the Roofing System Manufacturer's representative to ascertain that the roofing membrane system has been installed according to the manufacturer's approved specifications and details. Upon approval of the project, a Warranty shall be written.
- D. Should there be deviations or changes from this specification without written approval of the Roofing System Manufacturer and the Architect of Record the roofing system is not authorized for installation and is not eligible for Warranty coverage.
- E. All sealer, primer and adhesive products furnished shall comply with the local jurisdiction and be VOC compliant for the building location.

**1.07 DELIVERY AND STORAGE**

- A. All materials provided by the Roofing System Manufacturer shall be delivered with appropriate packaging labels indicating appropriate warnings, storage conditions, lot numbers, and usage instructions.

**Construction Specification****(FBO) SINGLE PLY TPO MEMBRANE ROOFING**

- B. All materials shall be delivered dry in manufacturer's original, unopened package and be properly stored off the ground on pallets, minimum 4" high and off the roof, except membrane which may be stored on standard packaging. Completely cover all other material with canvas tarpaulins to prevent the intrusion of water. Plastic covers will not be acceptable.

**1.08 ROOFING SYSTEM MANUFACTURER'S OBLIGATION**

- A. After the award of contract and after all materials, methods and procedures for the work are approved the General Contractor shall schedule a Pre-roofing Installation Meeting to be held at the site to include the General Contractor's Superintendent, Home Depot Project Manager, Roofing System Manufacturer's Representative assigned to the project and all trades related to the roofing installation including sign, decking, concrete, electrical, HVAC and plumbing contractors. All attendees shall be notified a minimum of 14 days prior to the meeting date and the meeting should be scheduled at or before the actual day the Roofing System installer is set up to start work. The project shall be reviewed with the Representative, the specifications discussed, and an orderly and practical approach to the project and the probable weather during construction resolved.
- B. Materials and equipment, other than those specified, are not to be used assumed as being satisfactory substitutes. It is understood and agreed that the use of materials other than those specified or approved in writing by the Architect of Record shall constitute a violation of the contract and the Architect of Record / Owner shall have the right to require the removal of such materials at the Roofing System Installer's expense.
- C. Roofing System Installer and subcontractors shall each provide a competent full-time Supervisor on the project, who shall be responsible for giving instructions for installation of the work. Roofing System Installer's Supervisor or superintendent shall be approved by the Owner and shall be replaced only with his permission. Roofing System Installer's Supervisor or superintendent shall represent the Roofing System Installer in his absence and all directions given to the Supervisor shall be binding as if given to the Roofing System Installer.
- D. Upon completion of the roofing work covered by these specifications, the Architect of Record will perform an inspection of the project prior to acceptance of the Work by the Owner. If any discrepancies are found during the inspection, subsequent costs for the Architect of Record to determine final compliance with the specifications will be charged against the Roofing System Installer.
- E. Whenever the word "certifications" or "certified" occurs in the specifications it shall be defined as a statement sworn to before a Notary and signed by a representative of the Roofing System Manufacturer making the statement that the time, service or material referred to conforms in all respects to the requirement of the specifications.
- F. The Roofing System Installer shall take all precautions necessary to avoid over stressing structural members and/or causing structural damage due to improperly placing concentrated loads on the roof deck.
- G. The Roofing System Installer shall state the number of business days required for completion of the roofing work as provided in Section FBO Roofing Specifications in the construction documents.
- H. Owner's construction coordinator will receive and pay for all testing agency invoices directly.

**1.09 PRECAUTIONS**

- A. Adhesives, primer and caulks as indicated are extremely flammable and/or toxic. Follow precautions indicated on can and carton labels.
- B. Surface to be bonded shall be dry, clean and free of debris. Suitable surfaces are usually considered to be smooth, solid masonry, wood and metal, plus insulation board fastened to the specific manufacturer's recommendations for receiving adhered roofing membranes and accepted by the membrane manufacturer for adhered applications of the membrane.
- C. All fasteners are recommended to be installed with a depth-sensing screw gun to prevent over-driving or under driving. An adapter tool is to be used for the installation of specialized fasteners.
- D. Block off or shut down positive pressure building ventilation systems during application to prevent sheet from billowing during applications (Performed by Others).
- E. Excessive patching as a result of damage to the membrane, or caused by faulty installation, may require total recover in those areas.
- F. Job preparation should always include provision to ensure positive drainage in all areas. Repair shall be performed by others prior to installation of the roofing system.
- G. For stores, which are subject to positive pressurization from wind or from air handling systems below the deck during construction, consult Roofing System Manufacturer for suitability of application and possible design enhancement requirements.

**Construction Specification****(FBO) SINGLE PLY TPO MEMBRANE ROOFING****1.10 GUARANTEE AND WARRANTY**

- A. Upon successful completion, final inspection and acceptance of the installation, the following warranties shall be issued to the Owner:
  - 1. The Roofing System Manufacturer shall issue a Full System warranty for a period of twenty (20) years from the date of Grand Opening. The warranty shall cover the membrane, insulation, flashing, adhesives, splice tape, fasteners, sealants and any miscellaneous items required for a complete roof installation as well as labor cost to remove and replace defective materials.
  - 2. Warranties and repair reports from the Roofing System Manufacturer shall be sent directly to the Maintenance Department.
- B. Neither the Owner's acceptance, nor payment, nor any provision in the Contract Documents shall relieve the Roofing System Manufacturer of the responsibility for faulty materials or workmanship and he shall remedy any defects due thereto which shall appear within a period of two (2) years from date of Grand Opening.
- C. The Owner has the right, in case of emergency at any time during the warranty period and without invalidating any warranty, to make any temporary repairs that are required in order to protect the building and the contents of the building from damage due to the roof leaking. The Owner must notify the Roofing System Manufacturer in writing within 72 hours after completing any such repairs.

**PART 2 - PRODUCTS****2.01 GENERAL**

- A. Provide entire roofing system in accordance with the following manufacturers:  
North American Roofing Systems, Inc.

**2.02 MEMBRANE**

- A. North American Roofing Systems Laser Weld white TPO Membrane shall be .060 in nominal thickness overall scrim-reinforced Thermoplastic Polyolefin sheet membrane nominal 6'-0" – 12'-0" in width, conforming to the minimum physical properties in Table 1.

**2.03 RELATED MATERIALS**

- A. Flashing: Flashing shall be same membrane as in Section 2.02 except for perimeter use of Metal for gravel stops or drip edge. Unreinforced Ethylene Propylene-based membrane shall be supplied for field fabricated vent stacks, pipes, drains and corners.
- B. Bonding Adhesive: Bonding Adhesive is a contact cement that is provided to adhere Membrane and flashing to various substrates e.g., insulation surfaces, masonry surfaces, plywood, concrete or metal. It is not acceptable to use bonding adhesive in seams.
- C. Perimeter sheets: Install perimeter sheets so as to comply with FM Windstorm resistance classification or per manufacturers recommendation, the more stringent to apply.
- D. All-Purpose Sealant: Provided to serve as water cut-off mastic, pitch-box sealer, and as a caulk to seal membrane to metal.
- E. Seam Caulk: Seam Caulk (white only) is a solvent-based caulk developed to seal exposed cut edges of reinforced membrane.
- F. Seam Cleaner: Seam Cleaner is a surface cleaner for use with membrane, which have become dirty or contaminated prior to heat welding.
- G. Mechanical fasteners: Shall be supplied by Roofing System Manufacturer. Insulation fastening shall consist of 3" diameter 26 gauge galvalume stress plates and minimum #12 – 10 Factory Mutual approved self-drilling screws exceeding FM 4470 corrosion standards. Membrane fastening shall consist of 2 3/8" diameter 22 gauge galvalume barbed seam plates fastened with minimum #14 – 10 Factory Mutual approved self-drilling screws exceeding FM 4470 corrosion standards.
- H. Termination Bar: Roofing System Manufacturer's termination bar fastened 8" o.c. is the only authorized material.
- I. Edge metal system: Roofing System Manufacturer's edge metal installed per standard detail is the only authorized material.

**Construction Specification****(FBO) SINGLE PLY TPO MEMBRANE ROOFING**

## J. Roof Walkways:

1. Protective walkway by North American Roofing Systems. Walkway pads shall be cut to length and welded to membrane per Roofing System Manufacturer's instructions.

K. Physical Properties: NA060 LaserWeld Membrane Technical Data  
Color: white; Weight: 4.11oz./sq.ft.

TABLE: 1

<u>Characteristic</u>	<u>ASTM Test Method</u>	<u>Physical Property</u>
Thickness	ASTM D-751	60 mil nominal
Breaking Strength	ASTM D-751	300 lbs X 300 lbs
Seam Strength	ASTM D-751	Pass
Elongation (min %)	ASTM D-751	50 x 47 warp/fill
Heat Aging	ASTM D-3045	95% x 95%
Tear Strength	ASTM D-751 (Tongue Method)	90 lbs x 95 lbs
Low Temperature Bend	ASTM D-2136	Pass -30C
Dimensional Change	ASTM D-1204	0.3%
Water Immersion	ASTM D-570	1.4%
Hydrostatic Resistance	ASTM D-751	550psi
Ozone Resistance	ASTM D-1149	Pass
Weather Resistance	ASTM G-26 (Xenon Arc)	12800 Hours Pass
Brittleness	ASTM-2137 (@-45C)	Pass

**2.04 ROOF INSULATION**

- A. Roof insulation shall be polyisocyanurate roof insulation minimum of 3.0" thick with a minimum "R" value of 22 (18.5 based on PIMA LTTR value). Polyisocyanurate shall have a typical compressive strength of 20 psi. Polyisocyanurate roof insulation shall meet Federal Specification HH-I-1972/2-Class I, UL Class A rating and Factory Mutual (FM) Class 1 approval.
1. Provide in all locations.
  2. Provide 1" rigid insulation at all preformed curbs without factory installed insulation.
- B. Alternate roof insulation:
1. 2 layers of Insulfoam EPS consisting of a bottom layer of 2.9" 1.0 lb. density and a 1.5" layer of 1.25 lb. density on to totaling 4.4" covered with a layer of Insulfoam Secure-Ply Slip Sheet overlayment.
  2. Insulfoam EPS Insulation combined with Densdeck
  3. Insulfoam EPS Insulation with Insulfoam Secure-Ply Slip Sheet factory laminated directly to the EPS
- C. All insulation shall be mechanically fastened to the roof deck with a minimum five (5) #14 fasteners per 48 inches per a 96 inch board. Additional fasteners shall be located as required to eliminate high spots in boards.
- D. Insulation joints shall be 1/4" or less in width. Repair all joints wider than 1/4" with insulation. Stagger all joints.
- E. Broken corners shall be cut out and replaced with sections of insulation large enough to be supported on two or more deck flutes.
- F. All roof insulation shall be installed in accordance with the recommendations of Factory Mutual (FM) and the roof insulation manufacturer.
- G. Tapered roof insulation and necessary fill boards forming all crickets between each scupper (where applicable), crickets on the high side of roof scuttle, crickets formed on high side of smoke/heat release vents, HVAC units and all other roof penetrations with curbs, as shown on roof plan shall be Type VIII (1.25lb) Expanded Polystyrene (EPS) meeting ASTM C-578, UL Class A. Taper insulation to provide 1/4" per foot minimum slope at areas noted as crickets on roof plan.
- H. Insulation must be accepted in writing by Roofing System Manufacturer.

**2.05 ACCESSORIES**

- A. Wood nailers shall be new pressure treated Southern Short Leaf Pine lumber (wolmanized), #2 or better (Furnished and installed by Others).
- B. Insulation fasteners and plates for roof insulation shall be by the Roofing System Manufacturer and shall meet FM requirements for Class 1 construction.

**PART 3 - EXECUTION****3.01 PREPARATION**

- A. Installation requirements:
  - 1. Dry in 7 working business days
  - 2. Substantial completion in 21 working business days
- B. Any delay of the roofing installation due to failure of the General Contractor to provide sufficient acceptable work areas for the roofing installation or any damage to the roof system by other trades will result in a change order for additional costs incurred.

**3.02 SUBSTRATE PREPARATION**

- A. Roof deck shall be covered with an approved insulation mechanically fastened to deck with manufacturer's approved fasteners.
- B. Plywood (if indicated on the drawings furnished and installed by others):
  - 1. Horizontal surfaces: plywood shall be a minimum of 5/8" thick
  - 2. Vertical surfaces: plywood to be a minimum of 1/2" thick with stud spacing of 16" on center or less.
  - 3. Sheathing shall be dry, clean, smooth, free of sharp edges, and suitable for acceptance of membrane.
  - 4. Plywood must be exterior grade with an A or B finish side up and with no joints gapped greater than 1/4 inch.
  - 5. Install slip plates over all gapped or uneven joints where membrane seams will cross to minimize welding inconsistency.
- C. Nailers: Pressure preservation treated wood nailers shall be installed at gravel stops or drip edges (furnished and installed by Others).
  - 1. As specified by the Architect of Record. A pressure preservative treated wood nailer is required.
  - 2. Nailer shall be anchored with a suitable fastener for the application having a minimum withdrawal of 100 lbs., staggered 6 inches o.c. within 8 feet of an outside corner and 12 inches o.c. along other perimeter areas.
  - 3. Nailer thickness shall be chosen to match the top surface of adjacent construction  $\pm 1/4$  inch. This permissible variation shall not contribute to ponding.
  - 4. D. The Roofing System Installer shall inspect the substrate surface to accept the Membrane. The substrate shall be smooth and free of sharp edges and other surface irregularities that will be detrimental to the 100% adhesion of the flashing membrane. Any repairs or modifications shall be done by Others.

**3.03 APPLICATION PROCEDURES**

- A. Insulation or protection board:
  - 1. Manufacturer's instruction: In regard to attachment, compatibility, and spanning of deck flutes, the manufacturers' instructions or specifications shall determine the suitability for an application, subject to acceptance by the Roofing System Manufacturer.
  - 2. Precautions: Care must be taken in handling insulation boards, as well as in their mechanical attachment, so as to not damage or rupture the facer and surface. All damaged areas must be cut out and replaced with structurally sound insulation, properly secured in place.
  - 3. Attachment: Insulation must be recommended by its manufacturer for mechanical attachment. All boards must be mechanically attached by FM approved plate and screw. Boards must be fastened sufficiently to conform to the substrate surface geometry and FM uplift requirements.
  - 4. Tapered insulation: Most tapered insulation systems taper down to a minimum 1/2 thickness only. Therefore, a tapered edge strip of high density fiber board must be used to provide a smooth transition to the flat areas
- B. Attachment of Membrane
  - 1. Membrane shall be attached with Screws and Plates.
- C. Installation
  - 1. Approved insulation boards shall be installed with the longest dimension perpendicular to the direction of the membrane seams and with end joints staggered. Boards will be butted as closely as possible with no gaps over 1/4 inch and mechanically attached.
  - 2. Perimeter sheets: Two or more sheets shall be installed at exposed perimeter areas, except when the building is less than 70 feet tall, and has a continuous 24 inch or higher parapet and located within ASCE Ground Roughness Categories A and B. Buildings located within ASCE Ground Roughness Categories C and D will have increased

**Construction Specification****(FBO) SINGLE PLY TPO MEMBRANE ROOFING**

- perimeter sheet requirements. They shall be laid out in an approved pattern. Plates and Screws shall be installed along the edge of the membrane through the insulation and into the roof deck. At perimeters that are to receive a gravel stop or metal edging, the membrane must be brought over the outside edge and secured at a minimum of 12 inches o.c. Follow FM requirements for wind uplift.
3. Field sheets: Membrane shall be unrolled on the area to be covered. Manufacturer's Plates and Screws are installed along the leading edge of the membrane, through the insulation and into the roof deck. Adjoining rolls of Membrane shall overlap the fastened edge of the installed membrane. (See Roofing System Manufacturer's standard details for fastener location and specific deck type penetrates requirements.)
- D. Lap splice: Membrane shall be overlapped and hot-air welded without any containments (adhesive, dirt, debris, etc.) prevalent in the seam.
1. The entire lap edge must be probed with an approved seam probing tool after it has cooled completely to verify seam consistency. Probing before the seam area has cooled will damage the membrane. In addition there should be a destructive test performed daily on a 3 inch wide area of seam weld to verify good peel strength. A properly welded seam will have membrane delamination from scrim prior to weld failure. Destruction tests on welds should be done for the first seam of the day, first seam after the robot welder has been allowed to cool down, and after any extreme changes in weather conditions. Cut edges shall be caulked by applying Seam/Caulk.
  2. The membrane, as with any material after exposure, will require cleaning prior to seaming. The approved method for cleaning the membrane prior to hot-air welding is as follows:
  3. Remove any visible dirt and debris with a clean rag and water. For heavily contaminated surfaces, scrubbing with a detergent cleaner followed by a water rinse may be necessary.
  4. With a clean scrub pad saturated with Seam Cleaner, aggressively agitate the seaming areas. With a clean white rag, follow with a final one swipe pass over the seaming area, careful to not redeposit any contaminants back onto the cleaned sheet surface.
  5. Allow Seam Cleaner to completely flash off (i.e. membrane should be completely dry).
  6. Follow the standard hot-air welding procedures with an approximated 20% reduction in speed or as approved by Roofing System Manufacturer.
  7. Final weld strength may not be achieved for several days.
- E. Perimeter fastening: Wood nailers are required for perimeter gravel stops or drip edges. Membrane may be fastened at other terminations by use of Plates and Screws.
1. Base of parapet or curb: Membrane shall be mechanically fastened 12 inches o.c. through insulation into deck. Fastening shall occur at parapet wall, curbs, fire and smoke vents, expansion joints, and any other roof penetrations that exceed 24 inches in any dimension.
- F. Flashing: Perimeter, curbs, vents, expansion joints, drains, and other details shall be flashed as shown on Drawings.
1. Apply Bonding Adhesive to both underside of flashing membrane and surface to which it is bonded.  
NOTE: Bonding adhesive shall not be applied to that portion of the flashing that overlaps onto itself. Hot-air welding shall be used throughout the system where membrane overlaps itself.
  2. Bonding Adhesive shall be allowed to dry to finger touch until it does not string or stick to a dry finger. Roll the flashing into the dry adhesive. Care must be taken to ensure that the flashing does not bridge where there is any elevation or directional change.
  3. All flashing shall be mechanically fastened at the top, under or through appropriate counter flashing with approved fasteners and with approved termination detail as shown on drawings.
  4. Metal flashings at perimeter shall be made and installed as per Roofing System Manufacturer's recommendations.
  5. Pipe flashings shall be installed in accordance with Roofing System Manufacturer's recommendations. Do not flash to lead.
  6. Expansion joints shall be installed in accordance with details shown on drawings.
  7. Roof drains shall be installed in accordance with Drawings and Roofing System Manufacturer's recommendations. All bolts must be properly secured to supply 100% continuous compression of the clamping ring. Field seams shall not be run through drains.
- G. Metal work: Metal work other than roof manufacturer's metal systems is not covered by manufacturer's Warranty.
1. Metal work shall be installed in a manner that prevents damage from buckling or wind.
  2. All metal work must be sealed and waterproofed in an acceptable manner.
- H. Overnight seal/temporary water stop: shall be made by a sealant method approved by the membrane manufacturer. To protect the insulation from inclement weather at the end of a day's work, the membrane is extended beyond the insulation and set into the approved overnight seal material. Roofing System Installer shall coordinate installation to ensure the system is made watertight at the end of each work day.

**3.04 ROOF SURFACE PREPARATION**

- A. The General Contractor shall be responsible for providing adequate surfaces to receive insulation, roofing and flashing. Prior to the onset of work, the Roofing System Installer shall inspect the entire area to be roofed with the Building



**Construction Specification****(FBO) SINGLE PLY TPO MEMBRANE ROOFING**

Owner's qualified roofing consultant or testing agency. Defects and improper conditions affecting roof installation shall be brought to the attention of the General Contractor in writing for correction. All roof decking, walls, nailers, projections including curbs, pipes, etc. shall be in place prior to commencement of roofing.

- B. The General Contractor will provide documentation to the FBO Roofing Installer that the deck and all related roof structures have been accepted by the Home Depot Testing Company prior to requesting the FBO Roofing Installer to man the project. Any costs related to the delay of the commencement or the completion of the FBO roofing installation will be charged to the General Contractor.
- C. Ponded water shall be removed from the roof surface.

**3.05 FIELD QUALITY CONTROL**

- A. The Owner will employ and pay for qualified Roofing Consultant or independent testing agency to perform the following testing and/or inspections for field quality control. Retesting of materials failing to meet specified requirements shall be done at Roofing System Installer's expense. Reinspection costs shall be done at the Roofing System Installer's expense.
  - 1. Upon notification by the Roofing System Installer that the roof and associated items are ready for inspection, the Owner's authorized testing / inspection agency and the Roofing System Manufacturer (warrantor) shall provide the final warranty inspection. This inspection shall occur simultaneously for both parties. Any testing or inspections after the final inspection will be done at Roofing System Installer's expense subject to preceded by Section 1.06, H.

**3.06 WALKWAY INSTALLATION**

- A. Walkway Installation:
  - 1. Install walkway material over clean, dry surfaces.
  - 2. Layout areas where walkway material is to be installed with most of the material being oriented so that it is placed between the field seams with each adjacent and abutting section gapped according to manufacturer's recommendations.
  - 3. Weld the perimeter of the properly positioned walkway material. Check seams for any voids or inconsistencies that might prevent water tightness. A double width (approximately 5'0") of protective walkway at all HVAC access panel locations.
  - 4. Apply seam sealant at all edges if required by Roofing System Manufacturer.

**3.07 WATERSTOPS**

- A. Install temporary cutoffs around incomplete edges of the roofing assembly at end of each day's work and when work must be postponed because of inclement weather. Straighten the insulation line using pieces of insulation loosely laid and seal the sheet membrane to the deck or existing membrane. Use a heavy application of roof cement or hot asphalt at least 6" in width overlaid with an embedded reinforcement. Remove the temporary seals completely when work resumes, cutting out the contaminated membrane. Remove all sealant, contaminated membrane, insulation fillers, etc., from the work area and properly dispose of off-site.

END OF SECTION

**PART 1 - GENERAL****1.01 SUMMARY**

- A. Extent of flashing and sheet metal work is indicated on drawings and includes the following:

1. Metal flashing and counter flashings
2. Gutters, conductor heads and downspout outlets.
3. Thru wall flashing.
4. Miscellaneous flashing and break metal

- B. Note: Flashing and sheet metal products that about the Single Ply TPO Membrane Roofing shall be furnished by owner as part of section 07620. All other flashing and sheet metal (including downspouts) shall be by the general contractor.

- C. Related work specified elsewhere include but not limited to:

1. Section 04200 - Brick Masonry (if applicable)
2. Section 04230 - Reinforced Unit Masonry (if applicable)
3. Section 07240 - Exterior Insulation and Finish Systems (if applicable)
4. Section 07406 - Metal Roof and Wall Panels
5. Section 07534 - Single Ply TPO Membrane Roofing
6. Section 07620 - TPO Flashing and Sheetmetal

**1.02 SUBMITTALS TO CONTRACTOR**

- A. Shop Drawings: Submit in accordance with Division 1. Indicate size, shapes, thicknesses, types of materials, finishes, fabrication details, anchors, connections, expansion joints and relation to adjacent work. Drawings shall be drawn to 1" = 1'-0" or larger scale.

**1.03 QUALITY ASSURANCE**

- A. Comply with Sheet Metal and Air Conditioning Contractors National Association (SMACNA) "Architectural Sheet Metal Manual."

- B. All primers and painting products furnished in this section shall be VOC compliant for building location.

**PART 2 - PRODUCTS****2.01 SHEET METAL**

- A. Sheet metal: Minimum 24 gauge G90 hot-dipped galvanized steel smooth commercial grade, except gutters, downspouts outlets and scuppers shall be 20 gauge. Units shall be of profile and dimensions shown on drawings complete with formed joint covers and flashing assembly and with prefabricated (mitered and hot soldered) corner units. Cap flashing joint shall have a 6" cover plate at lap joint.

**2.02 SHEET METAL MATERIALS**

- A. Zinc Coated Steel: G90 hot dipped galvanized to comply with ASTM A523 except ASTM A517 for lockformed quality (where tight bends and lock seams are required).
- B. Finish: Factory Applied Fluorocarbon Coating
1. Baked on epoxy primer 0.3 Mil. Thickness.
  2. Full strength 70% Kynar 500 Baked-on Coating to dry film thickness of 1.0 mil.
  3. Color as indicated on drawings.
  4. To include, but not limited to, cap flashing (coping), gutters, downspouts outlets, conductor heads and flashing.
- C. Cleats and straps: Same type and gauge metal as gutter, downspouts outlets and conductor heads.

**2.03 REGLETS**

- A. Manufacturer: Springlok Flashing System as manufactured by Fry Reglet Corporation

1. Models:

- a. "SM" – Surface Mounted
- b. "MA-4" - CMU Mounted (where applicable)
- c. "MA-1.5" - For Brick Mounted
- d. "Windlok Clip" – For use in high-wind conditions

- B. Product: Reglet and flashing shall be made of 24 ga. Galvanized steel. Finish shall be pre-finished color as specified in drawings. Reglet shall have a 2" factory-formed end lap, flashing shall have a 3" lap. Any shipment must be made in unopened cartons with the name of the manufacturer clearly visible on the carton and the name FRY on each length of each flashing. Reglet to be installed parallel with top of roof at least 7 inches above roof.

**2.04 ROOF DRAINAGE SHEET METAL FABRICATIONS**

- A. Hanging Gutters: Fabricate to cross section indicated, complete with end pieces, outlet tubes, and other accessories as

required. Fabricate in minimum 96-inch- long sections. Furnish flat-stock gutter spacers and gutter brackets fabricated from same metal as gutters, of size recommended by SMACNA but not less than twice the gutter thickness. Fabricate expansion joints, expansion-joint covers, gutter bead reinforcing bars, and gutter accessories from same metal as gutters.

- B. Gutters and downspouts can be field fabricated or provided by the following manufacturers:

1. Metal-Era

## 2.05 FABRICATED UNITS

- A. General Metal Fabrication: Shop-fabricate work to greatest extent possible. Comply with details and with applicable requirements of SMACNA "Architectural Sheet Metal Manual" and other recognized industry practices. Fabricate for waterproof and weather-resistant performance; with expansion provision for running work, sufficient to permanently prevent leakage, damage or deterioration of work. Form work to fit substrates. Comply with material with manufacturer instructions and recommendations for forming material. Form exposed sheet metal work without excessive oil-canning, buckling and tool marks, true to line and levels indicated, with exposed edges folded back to form hems.

- B. Cap flashing (coping) at corners: the horizontal (top) to be mitered leaving 1" lap under adjoining piece, apply sealant and pop rivet. At front (vertical) apply corner support clip, sealant, then butt vertical sides together and pop rivet.

OR

Make horizontal mitered cut at center of length of piece and bend vertical outside portion 90 degrees to make corner.

- C. Cap flashing expansion joint: Install base plate (12" wide with sides hemmed upward), sealant, cap flashing with 1/2" joint, sealant with 6" wide cover plate pop riveted on one side (at horizontal).

- D. Cleats: Continuous cleats, front and back

OR

Continuous cleat at front end individual cleats at back with bottom turned up over drip edge and pop riveted.

- E. Seams: Fabricated non-moving seams in sheet metal with flat-lock seams.

- F. Expansion Provisions:

1. Where lapped or bayonet-type expansion provisions in work cannot be used, or would not be sufficiently water/weatherproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).
2. Provide for thermal expansion of running gutters and other exposed items. Maintain a water tight seal at expansion joints. Locate expansion joints midway between drains, at high points in slopes, but in no case more than 30'-0" maximum spacing.

- G. Joint Sealant: Where movable, non-expansion type joints are indicated or required for proper performance of work, form metal to provide for proper installation of elastomeric sealant, in compliance with SMACNA standards..

## 2.06 FASTENERS

- A. Fasteners: Fasteners shall be of same material or compatible with sheet metal being fastened.

1. Rivets, screws and bolts shall be hard copper, brass or bronze except screws for aluminum shall be aluminum or stainless steel with exposed heads anodized to match sheets.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

- A. Anchor work in place with noncorrosive fasteners, adhesives, setting compounds, tapes and other materials and devices as recommended by manufacturer of each material or system. Provide for thermal expansion and building movements. Comply with recommendation of "Architectural Sheet Metal Manual" by SMACNA.

- B. Isolate from masonry, concrete and other dissimilar materials to prevent electrolysis, using bituminous paint or neoprene pads.

- C. Sheet Metal: Install sheet metal fascias and flashings with drip by screwing clips into wood nailer at 16" o.c. maximum. Screws shall be countersunk flat head type. Provide sheet metal in 12'-0" lengths with 1/4" expansion joints between lengths. Caulk using exterior building sealant, clear color, as specified in Caulking and Sealants Section.

- D. Install gutters to provide for positive drainage.

- E. Install metal cap flashing with hemmed edges and continuous cleats each side. Allow 1/2" expansion joint between cap flashing ends and provide joint cap as specified. The use of exposed fasteners to secure interior vertical leg of cap flashing to substrate is unacceptable.

## 3.02 PERFORMANCE

- A. Performance: Water-tight/weatherproof performance of flashing and sheet metal work is required.

**Construction Specification**

**FLASHING AND SHEETMETAL**

3.03 CLEANING

- A. Clean metal surfaces of substances that could cause corrosion.

END OF SECTION

**Construction Specification****(FBO) TPO FLASHING AND SHEETMETAL****PART 1 - GENERAL****1.01 SUMMARY**

- A. Extent of flashing and sheet metal work is indicated on drawings and includes the following:

1. Metal flashing and counter flashings for TPO membrane roof (only).
2. Rear Wall Gutter(s). 24" conductor heads and downspout outlets.
3. Thru wall flashing (scupper, overflow, etc.).

- B. Note: Only flashing and sheet metal products that about the Single Ply TPO Membrane Roofing shall be furnished by owner. All other flashing and sheet metal (including downspouts) shall be by the general contractor.

- C. Related work specified elsewhere:

1. Section 01010 - Furnished By Owner Items (FBO)
2. Section 07534 - Single Ply TPO Membrane Roofing

**1.02 FBO PROCEDURES**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section. General requirements related to Furnished by Owner (FBO) Items are as defined in Section 01010. All FBO Forms listed below are included as part of Section 01010.

- B. Vendor Contact: Contractor shall send a completed "FBO Form A: Contractor Information Form" to the FBO vendor indicated below, twelve (12) weeks prior to the scheduled installation of the specified system:

North American Roofing Systems, Inc.

Contact: Jeff Sherrill or Carson Thomas

Phone: (800) 551-5602

Fax: (none)

E-mail: [jsherrill@naroofting.com](mailto:jsherrill@naroofting.com) or [cthomas@naroofting.com](mailto:cthomas@naroofting.com)

- C. Take-Offs: FBO Vendor shall provide "take-offs" to the Contractor as specified in Section 01010. The Contractor shall then verify this "take-off" using an "FBO Form B: Take Off Confirmation Sheet".

- D. Receipt Of Shipment: Contractor shall verify shipment per the requirements of Section 01010 and complete the "FBO Form C: Confirmation of Shipment" and submit back to the FBO vendor.

- E. Request for Changes: Changes to materials and quantities after receipt of shipment shall be coordinated by the contractor with the FBO vendor per the requirements of Section 01010 using an "FBO Form D: Request For Additional/Replacement Materials".
- F. Return Merchandise Authorization Policy: The Home Depot will add to the contractors' scope of work the responsibility for coordinating (1) customer accommodation return request through the FBO Vendor. Requests shall be submitted using the "FBO Form E: Returned Materials" as specified in Section 01010.

**1.03 SUBMITTALS TO CONTRACTOR**

- A. Shop Drawings: Submit in accordance with Division 1. Indicate size, shapes, thicknesses, types of materials, finishes, fabrication details, anchors, connections, expansion joints and relation to adjacent work. Drawings shall be drawn to 1" = 1'-0" or larger scale.

**1.04 QUALITY ASSURANCE**

- A. Comply with Sheet Metal and Air Conditioning Contractors National Association (SMACNA) "Architectural Sheet Metal Manual."

- B. All primers and painting products furnished in this section shall be VOC compliant for building location.

**PART 2 - PRODUCTS****2.01 SHEET METAL**

- A. Sheet metal: Minimum 24 gauge G90 hot-dipped galvanized steel smooth commercial grade, except gutters, downspouts outlets and scuppers shall be 20 gauge. Units shall be of profile and dimensions shown on drawings complete with formed joint covers and flashing assembly and with prefabricated (mitered and hot soldered) corner units. Cap flashing joint shall have a 6" cover plate at lap joint.

**2.02 SHEET METAL MATERIALS**

- A. Zinc Coated Steel: G90 hot dipped galvanized to comply with ASTM A523 except ASTM A517 for lockformed quality (where tight bends and lock seams are required).

- B. Finish: Factory Applied Fluorocarbon Coating
1. Baked on epoxy primer 0.3 Mil. Thickness.
  2. Full strength 70% Kynar 500 Baked-on Coating to dry film thickness of 1.0 mil.
  3. Color as indicated on drawings.
  4. To include, but not limited to, cap flashing (coping), gutters, downspouts outlets, conductor heads and flashing.
- C. Cleats and straps: Same type and gauge metal as gutter, downspouts outlets and conductor heads.

**2.03 REGLETS**

- A. Manufacturer: Springlok Flashing System as manufactured by Fry Reglet Corporation
1. Models:
- a. "SM" – Surface Mounted
  - b. "MA-4" - CMU Mounted (where applicable)
  - c. "MA-1.5" – For Brick Mounted
  - d. "Windlok Clip" – For use in high-wind conditions

- B. Product: Reglet and flashing shall be made of 24 ga. Galvanized steel. Finish shall be pre-finished color as specified in drawings. Reglet shall have a 2" factory-formed end lap; flashing shall have a 3" lap. **Any shipment must be made in unopened cartons with the name of the manufacturer clearly visible on the carton and the name FRY on each length of each flashing.** Reglet to be installed parallel with top of roof at least 7 inches above roof.

**2.04 ROOF DRAINAGE SHEET METAL FABRICATIONS**

- A. Gutters and downspouts can be fabricated by FBO Vendor or provided by the following manufacturers:
1. Metal-Era
- B. Hanging Gutters: Fabricate to cross section indicated, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in minimum 96-inch- long sections. Furnish flat-stock gutter spacers and gutter brackets fabricated from same metal as gutters, of size recommended by SMACNA but not less than twice the gutter thickness. Fabricate expansion joints, expansion-joint covers, gutter bead reinforcing bars, and gutter accessories from same metal as gutters.

**2.05 FABRICATED UNITS**

- A. General Metal Fabrication: Shop-fabricate work to greatest extend possible. Comply with details and with applicable requirements of SMACNA "Architectural Sheet Metal Manual" and other recognized industry practices. Fabricate for waterproof and weather-resistant performance; with expansion provision for running work, sufficient to permanently prevent leakage, damage or deterioration of work. Form work to fit substrates. Comply with material with manufacturer instructions and recommendations for forming material. Form exposed sheet metal work without excessive oil-canning, buckling and tool marks, true to line and levels indicated, with exposed edges folded back to form hems.
- B. Cap flashing (coping) at corners: the horizontal (top) to be mitered leaving 1" lap under adjoining piece, apply sealant and pop rivet. At front (vertical) apply corner support clip, sealant, then butt vertical sides together and pop rivet.
- OR
- Make horizontal mitered cut at center of length of piece and bend vertical outside portion 90 degrees to make corner.
- C. Cap flashing expansion joint: Install base plate (12" wide with sides hemmed upward), sealant, cap flashing with 1/2" joint, sealant with 6" wide cover plate pop riveted on one side (at horizontal).
- D. Cleats: Continuous cleats, front and back
- OR
- Continuous cleat at front end individual cleats at back with bottom turned up over drip edge and pop riveted.
- E. Seams: Fabricated non-moving seams in sheet metal with flat-lock seams.
- F. Expansion Provisions:
1. Where lapped or bayonet-type expansion provisions in work cannot be used, or would not be sufficiently water/weatherproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).
  2. Provide for thermal expansion of running gutters and other exposed items. Maintain a water tight seal at expansion joints. Locate expansion joints midway between drains, at high points in slopes, but in no case more than 30'-0" maximum spacing.
- G. Joint Sealant: Where movable, non-expansion type joints are indicated or required for proper performance of work, form metal to provide for proper installation of elastomeric sealant, in compliance with SMACNA standards..

**2.06 FASTENERS**

- A. Fasteners: Fasteners shall be of same material or compatible with sheet metal being fastened.

1. Rivets, screws and bolts shall be hard copper, brass or bronze except screws for aluminum shall be aluminum or stainless steel with exposed heads anodized to match sheets.

**PART 3 - EXECUTION****3.01 INSTALLATION**

- A. Anchor work in place with noncorrosive fasteners, adhesives, setting compounds, tapes and other materials and devices as recommended by manufacturer of each material or system. Provide for thermal expansion and building movements. Comply with recommendation of "Architectural Sheet Metal Manual" by SMACNA.
  - B. Isolate from masonry, concrete and other dissimilar materials to prevent electrolysis, using bituminous paint or neoprene pads.
  - C. Sheet Metal: Install sheet metal fascias and flashings with drip by screwing clips into wood nailer at 16" o.c. maximum. Screws shall be countersunk flat head type. Provide sheet metal in 12'-0" lengths with 1/4" expansion joints between lengths. Caulk using exterior building sealant, clear color, as specified in Caulking and Sealants Section.
  - D. Install gutters to provide for positive drainage.
  - E. Install metal cap flashing with hemmed edges and continuous cleats each side. Allow 1/2" expansion joint between cap flashing ends and provide joint cap as specified. The use of exposed fasteners to secure interior vertical leg of cap flashing to substrate is unacceptable.
- 3.02 PERFORMANCE**
- A. Performance: Water-tight/weatherproof performance of flashing and sheet metal work is required.
- 3.03 CLEANING**
- A. Clean metal surfaces of substances that could cause corrosion.

END OF SECTION

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**Construction Specification**

Section 07701  
**(FBO) ROOF HATCH**

**PART 1 - GENERAL****1.01 SUMMARY**

- A. Extent and locations of roof accessories is indicated on the drawings and includes the following:
  - 1. Roof hatches with safety post.
- B. Related work specified elsewhere:
  - 1. Section 01010 - Furnished By Owner Items (FBO)
  - 2. Section 09900 - Painting.

**1.01 FBO PROCEDURES**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section. General requirements related to Furnished by Owner (FBO) Items are as defined in Section 01010. All FBO Forms listed below are included as part of Section 01010.
- B. Vendor Contact: Contractor shall send a completed "FBO Form A: Contractor Information Form" to the FBO vendor indicated below, twelve (12) weeks prior to the scheduled installation of the specified system:

North American Roofing Systems, Inc.

Contact: Jeff Sherrill or Carson Thomas

Phone: (800) 551-5602

Fax: (none)

E-mail: [jsherrill@narroofing.com](mailto:jsherrill@narroofing.com) or [cthomas@narroofing.com](mailto:cthomas@narroofing.com)

- C. Take-Offs: FBO Vendor shall provide "take-offs" to the Contractor as specified in Section 01010. The Contractor shall then verify this "take-off" using an "FBO Form B: Take Off Confirmation Sheet".
- D. Receipt Of Shipment: Contractor shall verify shipment per the requirements of Section 01010 and complete the "FBO Form C: Confirmation of Shipment" and submit back to the FBO vendor.
- E. Request for Changes: Changes to materials and quantities after receipt of shipment shall be coordinated by the contractor with the FBO vendor per the requirements of Section 01010 using an "FBO Form D: Request For Additional/Replacement Materials"
- F. Return Merchandise Authorization Policy: The Home Depot will add to the contractors' scope of work the responsibility for coordinating (1) customer accommodation return request through the FBO Vendor. Requests shall be submitted using the "FBO Form E: Returned Materials" as specified in Section 01010.

**1.02 QUALITY CRITERIA**

- A. Substitutions: Manufacturers having products of type, function and quality to those named may request acceptance of those products in accordance with substitution provisions of Division 1.

**PART 2 - PRODUCTS****2.01 ROOF HATCH**

- A. Furnish and install where indicated on plans metal roof scuttle Type S-20 as manufactured by The Bilco Company, New Haven, Connecticut. Cover and curb shall be steel (red oxide primer) 14 ga. with beaded flange, neatly welded.
- B. Curb shall be 12" in height and of 14 gauge steel (red oxide primer). Curb shall be formed with a 3-1/2" flange with holes provided for securing to the roof deck. Curb shall be equipped with an integral metal cap flashing of the same gauge and material as the curb, fully welded at the corners for weather tightness. Insulation of the curb shall be rigid fiber board 1" in thickness. 1" x Nailer strip shall be mounted at top of curb for securing roofing materials. Insulation and nailer shall be fully covered and protected by steel (red oxide primer) 22 ga. cover liner.
- C. Scuttle shall be completely assembled with heavy pintle hinges, compression spring operators enclosed in telescopic tubes, positive snap latch with turn handles and padlock hasps inside and outside, and neoprene draft seal. Cover shall be equipped with an automatic hold-open arm complete with red vinyl grip handle to permit easy, one hand release. All hardware shall be cadmium plated, and factory finish shall be mill finish. Installation shall be in accordance with manufacturer's instructions. Manufacturer shall guarantee against defects in material or workmanship for a period of five years from the date of the Grand Opening.
- D. Install on fixed ladder below hatch cover Model 1 LadderUP safety post as manufactured by The Bilco Company, New Haven Connecticut or equal. Device shall be manufactured of high strength steel with telescoping tubular section that locks automatically when fully extended. Upward and downward movement shall be controlled by a stainless steel spring balancing mechanism. Finish shall be black enamel. Unit shall be completely assembled with fasteners for securing to the ladder rungs in accordance with the manufacturer's instructions.



**PART 3 - EXECUTION****3.01 INSPECTION**

- A. Installer shall examine the substrates and conditions under which the roof scuttle is to be installed and notify the Project Manager in writing of conditions detrimental to the completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.

**3.02 INSTALLATION**

- A. General: Comply with manufacturer's instructions and recommendations. Coordinate with installation of roof deck and other substrates to receive accessory units, and roof insulation, roofing and flashing: as required to ensure that each element of the work performs properly, and that combined elements are waterproof and weathertight. Anchor units securely to supporting structural substrates, adequate to withstand lateral and thermal stresses as well as inward and outward loading pressures.
- B. Flange Seals: Except as otherwise indicated, set flanges of accessory units in a thick bed of elastomeric sealant.
- C. Install safety post per manufacturer's instructions.
- D. Field paint primed cover.
- E. Operational Units: Test operate units with operable components. Clean and lubricate joints and hardware. Adjust for proper operation.

**3.03 CLEANING AND PROTECTION**

- A. Clean exposed metal surfaces in accordance with manufacturer's instructions. Touch up damaged metal coatings.

**END OF SECTION**

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Section 07720  
**Construction Specification**      **(FBO) MANUFACTURED STRUCTURAL ROOF CURBS**

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**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Extent and locations of structural roof curbs is indicated on the drawings and includes the following:
1. Roof top units, make-up air units, and evaporative coolers.
  2. Coordination with manufacturers and suppliers of curb-mounted rooftop equipment.
- B. Related work specified elsewhere includes, but may not be limited to:
1. Section 01010 - Furnished By Owner Items (FBO)
  2. Structural roof framing (Division 5)
  3. Roofing material (Division 7)
  4. Painting materials and methods (Division 9)
  5. Mechanical (HVAC) equipment (Division 15)

- C. Curb shall be constructed in accordance with the National Roofing Contractors Association (NRCA) guidelines

**1.02 FBO PROCEDURES**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section. General requirements related to Furnished by Owner (FBO) Items are as defined in Section 01010. All FBO Forms listed below are included as part of Section 01010.

- B. Vendor Contact: Contractor shall send a completed "FBO Form A: Contractor Information Form" to the FBO vendor indicated below, twelve (12) weeks prior to the scheduled installation of the specified system:

Lennox Industries  
105 Summer Breeze Glen  
Sugar Hill, GA

National Accounts: Walker Roth  
Office: (404) 759-4878  
Fax: (none)

E-Mail: [walker.roth@lennoxind.com](mailto:walker.roth@lennoxind.com)

Pricing and Ordering: Derek Garen  
Office: (800) 367-6285  
Fax: (none)

E-Mail: [Derek.garen@lennoxind.com](mailto:Derek.garen@lennoxind.com)

- C. Take-Offs: FBO Vendor shall provide "take-offs" to the Contractor as specified in Section 01010. The Contractor shall then verify this "take-off" using an "FBO Form B: Take Off Confirmation Sheet".

- D. Receipt Of Shipment: Contractor shall verify shipment per the requirements of Section 01010 and complete the "FBO Form C: Confirmation of Shipment" and submit back to the FBO vendor.

- E. Request for Changes: Changes to materials and quantities after receipt of shipment shall be coordinated by the contractor with the FBO vendor per the requirements of Section 01010 using an "FBO Form D: Request For Additional/Replacement Materials"

- F. Return Merchandise Authorization Policy: The Home Depot will add to the contractors' scope of work the responsibility for coordinating (1) customer accommodation return request through the FBO Vendor. Requests shall be submitted using the "FBO Form E: Returned Materials" as specified is Section 01010.

**1.03 SUBMITTALS TO CONTRACTOR**

A. Shop Drawings

1. Submit shop drawings in accordance with Section 01300.
2. Submit shop drawings to the Contractor for review prior to fabrication. All drawings and details shall be checked by the General Contractor and bear the initials of the checker prior to review submission.
3. Items requiring field measuring shall have all dimensions verified in the field before fabrication.
4. Where required by jurisdiction, all shop drawings shall be signed and sealed by the manufacturer's engineer with the registered engineer's seal for the state where the structure is located.

- B. Manufacturer's Certification: Submit manufacturer's certification stating that all structural roof curbs used on this project have been designed and manufactured in accordance with the drawings and project specifications. Where required by jurisdiction, manufacturer's certification shall be signed and sealed by the manufacturer's engineer with the registered engineer's seal for the state where the structure is located.

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Section 07720  
**Construction Specification**      **(FBO) MANUFACTURED STRUCTURAL ROOF CURBS**

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- C. Design Calculations: Design calculations for all structural roof curbs used on this project shall be submitted only when requested by the Owner's Representative for submittal to the building official or for information. The Architect of Record will not review design calculations. All design calculations shall be signed and sealed by the manufacturer's engineer with the registered engineer's seal for the state where the structure is located.

- D. Review of submittals is only for review of general conformance with the design concept including verification of the design loads shown on the shop drawings. In no case shall this review relieve the contractor of the responsibility for design, general or detailed dimensions, quality or quantity of materials or any other conditions, functions, performance or guarantees required.

**1.04 QUALITY CRITERIA**

- A. Substitutions: Manufacturers having products of type, function and quality to those named may request acceptance of those products in accordance with substitution provisions of Division 1.

**1.05 DELIVERY, STORAGE AND HANDLING**

- A. Curbs shall be shipped to the construction site crated.
- B. Curb manufacturer shall furnish curb schedule to Contractor identifying curb "Type" and roof penetration for which curb is to be used. Curb schedule shall identify identical curbs as single "Type" (e.g., Type A – 3 ton RTUs, Type B – 10 ton RTUs, etc.). Identify each curb with appropriate "Type" designation.
- C. Stack curbs at site to prevent twisting, bending or permanent deformation.

**PART 2 - PRODUCTS**

**2.01 MANUFACTURERS**

- A. Curbs Plus Inc.

**2.02 MATERIALS**

- A. Sheet Steel (One of the following at the Contractor's option)
1. Galvanized Steel Sheet: ASTM A446 and ASTM A525, Grade A, G90 hot-dip zinc coating.
  2. Aluminum-coated Steel Sheet: ASTM A463, Type 2, T2 100 aluminum coating.
  3. Aluminum Zinc Alloy-coated Steel Sheet (Galvalume): ASTM A792, AZ55 aluminum zinc alloy coating.

- B. Board Insulation (by others): Match roofing insulation, as specified elsewhere under Division 7. Install insulation on outside surface of curb.

- C. Wood Nailers: CCA Pressure Treated Lumber Type C, "Standard" grade lumber of any species

- D. Zinc-Rich Primer: SSPC-Paint 20 Type II.

- E. Alkyd Finish Paint (by others): Match IPS-4, as specified in section 09900.

**2.03 STRUCTURAL ROOF CURBS**

- A. Fabrication, General: Coated steel sheet curb sections, corners fully mitered and welded; 2" x 4" (nominal) pressure treated continuous wood nailers mechanically fastened at 12" on center to exterior face of curb. Shop prime welded connections with zinc-rich paint complying with SSPC-Paint 20.

1. Profile
  - a. Bottom Flange Width: 3"
  - b. Web Height: Comply with local code requirements for minimum curb height, but in no case shall curb height be less than 14", as measured from top of bar joist to top of curb, nor shall curb height be less than 8", as measured from top of roof membrane to top of curb.
  - c. Top Flange Width: 1-13/16"
  - d. Drip: 1"
  - e. Slope: Match roof (refer to drawings)
2. Sheet Metal Weight: 16 gauge minimum

- B. Design curb sections as required for design loads indicated on Drawings. Refer to construction drawings for requirements.

- C. Welding: American Welding Society (AWS) D1.1

- D. Rooftop Unit (RTU), Make-up Air Unit (MUA), and Evaporative Cooler (EC) Curbs: Provide structural roof curbs with full depth duct channels of same gauge metal as perimeter curb sections.

- E. Burglar Bars (where specified): 1/2" smooth hot-rolled solid steel bars welded in a grid pattern, 8" on centers each way. Weld

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Section 07720

**Construction Specification**                      **(FBO) MANUFACTURED STRUCTURAL ROOF CURBS**

to inside bottom of curb as indicated on drawings, prior to shipment.

- F. Curb shall be constructed to allow installing and securing ductwork to curb prior to mounting unit.
- G. Provide supply and return air gasketing.

**PART 3 - EXECUTION**

**3.01 INSTALLATION**

- A. Install curbs in accordance with manufacturer's instructions and as indicated on Drawings. Coordinate installation with roof membrane installation requirements specified under other Sections.
- B. Connection to Roof Framing
  - 1. Set units in place and secure base to roof structure by welding to top chord of structural member.
  - 2. Secure metal deck to perimeter of curb as indicated on Drawings.

**3.02 COORDINATION**

- A. Coordinate project requirements for custom adapting and connecting to roof curbs with manufacturers and suppliers of curb mounted items and equipment
- B. Provide structural roof curbs as indicated, including, but not limited to, the following:
  - 1. HVAC rooftop units (RTUs).
  - 2. Exhaust Fans (EFs)
  - 3. Make-up Air units (MUAs), where specified

**END OF SECTION**

**PART 1 - GENERAL****1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

**1.02 SUMMARY**

- A. This Section includes firestopping for the following:

1. Penetrations through fire-resistance-rated ceiling and roof construction including both empty openings and openings containing cables, pipes, ducts, conduits and other penetrating items.
2. Penetrations through fire-resistance-rated walls and partitions including both empty openings and openings containing cable, pipes, ducts, conduits and other penetrating items.
3. Penetrations through smoke barriers and construction enclosing compartmentalized areas involving both empty openings and openings containing penetrating items.
4. Sealant joints in fire-resistance-rated construction.

- B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Section 01012 - Preferred Purchasing
2. Section 03300 - Cast-In-Place Concrete (for construction of openings in concrete slabs).
3. Section 04230 - Reinforced Unit Masonry (for joint fillers for non-fire-resistive-rated masonry construction).
4. Section 07201 - Building Insulation (for sealing insulation and accessories).
5. Section 07901 - Joint Sealers/Fillers (for non-fire-resistive-rated joint sealants).
6. Division 15 - specifying ducts and piping penetrations.
7. Division 16 - specifying cable and conduit penetrations.

**1.03 PREFERRED PURCHASING**

- A. Unless noted otherwise, Contractor and all subcontractors are encouraged to purchase all products listed in this specification section from a local The Home Depot Store. For more information, refer to Section 01012.

**1.04 REFERENCES**

- A. American Society for Testing and Materials Standards (ASTM):
1. ASTM E 84: Standard Test Method for Surface Burning Characteristics of Building Materials.
  2. ASTM E 814: Standard Test Methods for Fire Tests of Through-Penetration Firestops.
  3. ASTM E 119: Standard Test Methods for Fire Tests of Building Construction Materials.
  4. ASTM E 1725: Standard Test Methods for Fire Tests of Fire-Resistive Barrier Systems of Electrical Systems Components.
  5. ASTM E 1966: Standard Test Method for Fire-Resistive Joint Systems.
  6. ASTM C 411: Standard Test Method for Hot Surface Performance of High Temperature Thermal Insulation
  7. ASTM E 136: Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C
  8. ASTM E 2307: Standard Test Method for Determining Fire Resistance of Perimeter Fire Barrier Systems Using Intermediate, Scale Multi-Story Apparatus

- B. Underwriters Laboratories, Inc. (UL):

1. UL 723 Standard for Test of Surface Burning Characteristics of Building Materials
2. UL 1479 Standard for Fire Tests of Through-Penetration Firestops, including optional air leakage test.
3. UL 2079 Standard for Tests for Fire Resistance of Building Joint Systems

- C. National Fire Protection Agency (NFPA)

1. NFPA 90A, **2018 Edition**: Standard for the Installation of Air Conditioning and Ventilation Systems.
2. NFPA 96: Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations
3. NFPA 101: Life Safety Code

- D. Nationally Recognized Testing Laboratories:

1. Omega Point Laboratories (OPL)
2. Southwest Research Institute (SwRI)
3. Underwriters Laboratories Inc. (UL)
4. Warnock Hersey (WH)
5. Others as certified by the building code bodies.

**1.05 SYSTEM PERFORMANCE REQUIREMENTS**

- A. General: Provide firestopping systems that are produced and installed to resist the spread of fire, according to requirements indicated, and the passage of smoke and other gases.
- B. F-Rated Through-Penetration Firestopping Systems: Provide through-penetration fire stop system with F ratings indicated, as determined per ASTM E 814, but not less than that equaling or exceeding the fire-resistance rating of the constructions

penetrated.

- C. T-Rated Through-Penetration Fire Stop Systems: Provide through-penetration fire stop systems with T ratings, in addition to F ratings, as determined per ASTM E 814, where indicated and where systems protect penetrating items exposed to contact with adjacent materials in occupable floor areas. T-rated assemblies are required where the following conditions exist:

1. Where fire stop systems protect penetrations located outside of wall cavities.
2. Where fire stop systems protect penetrations located outside fire-resistive shaft enclosures.
3. Where fire stop systems protect penetrations located in construction containing doors required to have a temperature-rise rating.
4. Where fire stop systems protect penetrating items larger than a 4-inch-diameter nominal pipe or 16 sq. in. in overall cross-sectional area.

- D. Fire-Resistive Joint Sealants: Provide joint sealants with fire-resistance ratings indicated, as determined per ASTM E 119, but not less than that equaling or exceeding the fire-resistance rating of the construction in which the joint occurs.

- E. For firestopping exposed to view, traffic, moisture, and physical damage, provide products that do not deteriorate when exposed to these conditions.

1. For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration fire stop systems.
2. For floor penetrations with annular spaces exceeding 4 inches or more in width and exposed to possible loading and traffic, provide fire stop systems capable of supporting the floor loads involved either by installing floor plates or by other means.
3. For penetrations involving insulated piping, provide through-penetration fire stop systems not requiring removal on insulation.

- F. For firestopping exposed to view, provide products with flame-spread values of less than 25 and smoke-developed values of less than 450, as determined per ASTM E 84.

#### 1.06 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: Provide firestopping that complies with the following requirements and those specified under the "System Performance Requirements" article:

1. Firestopping tests are performed by a qualified testing and inspecting agency. A qualified testing and inspecting agency is UL, Warnock Hersey, or another agency performing testing and follow-up inspection services for fire stop systems that is acceptable to authorities having jurisdiction.
2. Through-penetration fire stop systems are identical to those tested per ASTM E 814 under conditions where positive furnace pressure differential of at least 0.01 inch of water is maintained at a distance of 0.78 inch below the fill materials surrounding the penetrating items in the test assembly. Provide rated systems complying with the following requirements:
3. Fire-resistive joint sealant system are identical to those tested for fire-response characteristics per ASTM E 119 under conditions where the positive furnace pressure differential is at least 0.01 inch of water, as measured 0.78 inch from the face exposed to furnace fire. Provide systems complying with the following requirements:
  - a. Fire-Resistance Ratings of Joint Sealants: As indicated by reference to design designations listed by UL in their "Fire Resistance Directory" or by another qualified testing and inspecting agency.
  - b. Joint sealants, including backing materials, bear classification marking of qualified testing and inspection agency.

- B. Information on drawings referring to specific design designations of through-penetration fire stop systems is intended to establish requirements for performance based on conditions that are expected to exist during installation. Any changes in conditions and designated systems require the Architect's prior approval. Submit documentation showing that the performance of proposed substitutions equals or exceeds that of the systems they would replace and are acceptable to authorities having jurisdiction.

- C. Installer Qualifications: Engage an experienced installer who has completed firestopping that is similar in material, design, and extent to that indicated for Project and that has performed successfully.

- D. Single-Source Responsibility: Obtain through-penetration fire stop systems for each kind of penetration and construction condition indicated from a single manufacturer.

- E. Provide firestopping products containing no detectable asbestos as determined by the method specified in 40 CFR Part 763, Subpart F, Appendix A, Section 1, "Polarized Light Microscopy".

- F. Coordinating Work: Coordinate construction of openings and penetrating items to ensure that designated through penetration fire stop systems are installed per specified requirements.

#### 1.07 DELIVERY, STORAGE AND HANDLING

- A. Deliver firestopping products to Project site in original, unopened containers or packages with intact and legible manufacturer's labels identifying product and manufacturer; date of manufacture; lot number, shelf life, if applicable, qualified testing and inspecting agency's classification marking applicable to Project; curing time; and mixing instructions for multi component

materials.

- B. Store and handle firestopping materials to prevent their deterioration or damage due to moisture, temperature changes, contaminants or other causes.

#### 1.08 PROJECT CONDITIONS

- A. Environmental Conditions: Do not install firestopping when ambient or substrate temperatures are outside limits permitted by firestopping manufacturers or when substrates are set due to rain, frost, condensation or other causes.

- B. Ventilation: Ventilate firestopping per firestopping manufacturer's instructions by natural means, or where this is inadequate forced air circulation.

#### 1.09 SEQUENCING AND SCHEDULING

- A. Notify Owner's Project Manager at least 1 week in advance of firestopping installations; confirm dates and times on days preceding each series of installations.

- B. Do not cover up those firestopping installations that will become concealed behind other construction until Owner's Representative and authorities having jurisdiction, if required, have examined each installation.

### PART 2 - PRODUCTS

#### 2.01 FIRESTOPPING, GENERAL

- A. Compatibility: Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by firestopping manufacturer based on testing and field experience.

- B. Application: Provide firestopping systems composed of materials specified in this Section that comply with system performance and other requirements.

#### 2.02 FILL MATERIALS FOR THROUGH-PENETRATION FIRE STOP SYSTEMS

- A. Endothermic, Latex Compound Sealant:

1. Single-component, endothermic, latex formulation.
2. Acceptable Products:
  - a. 3M Fire Protection Products: Fire Dam 150+ Caulk
  - b. Tremco Inc.: Fyre-Shield

- B. Intumescent Latex Sealants and Caulks:

1. Single-component, intumescent, latex formulation.
2. Acceptable Products:
  - a. 3M Fire Protection Products: Fire Barrier CP 25WB+ Caulk or IC 15WB Caulk
  - b. Hilti Inc.: FS-One
  - c. RectorSeal: Metacaulk 950

- C. Intumescent Putty:

1. Non-hardening, dielectric, water-resistant putty containing no solvents, inorganic fibers, or silicone compounds.
2. Acceptable Products:
  - a. 3M Fire Protection Products: Fire Barrier Moldable Putty+
  - b. Hilti Inc.: CP 617 Putty Pad or CP 618 Putty Stick
  - c. RectorSeal: Metacaulk Fire Rated Putty
  - d. Tremco: TREMstop Putty

- D. Intumescent Wrap Strips:

1. Single-component, elastomeric sheet with aluminum foil on one side.
2. Acceptable Products:
  - a. 3M Fire Protection Products: Fire Barrier FS-195+ Wrap/Strip
  - b. Hilti, Inc.: CP 645 Wrap Strips
  - c. Rectorseal: Metacaulk Wrap Strips

**E. Mortar:**

1. Prepackaged dry mix composed of a blend of inorganic binders, fillers and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogenous mortar.
2. Acceptable Products:
  - a. 3M Fire Protection Products: FireBarrier Mortar
  - b. Hilti, Inc.: CP 637 Firestop Mortar
  - c. Rectorseal: Metacaulk Fire Rated Mortar
  - d. Tremco: TREMstop Fire Mortar

**F. Pillows/Bags and Intumescent Blocks/Plugs:**

1. Re-usable, heat-expanding pillows/bags composed of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents and fire-retardant additives. Ready to use intumescent flexible plug based on a two-component polyurethane foam
2. Acceptable Products:
  - a. 3M Fire Protection Products: FireBarrier Pillow or FireBarrier Self Locking Pillow
  - b. Hilti, Inc.: CP 658T Firestop Plug or FS 657 Fire Block
  - c. Rectorseal: Metacaulk Firestop Pillows

**G. Silicone Foam:**

1. Two-component, silicone-based liquid elastomer that, when mixed, expand and cures in place to produce a flexible, nonshrinking foam.
2. Acceptable Products:
  - a. 3M Fire Protection Products: FireBarrier 2001 Silicone RTV Foam

**H. Silicone Sealant:**

1. Moisture-curing, single-component, silicone-based, neutral-curing elastomeric sealant of grade indicated below:
  - a. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces and non-sag formulation for openings in vertical and other surfaces requiring a nonslumping/gunnable sealant, unless indicated fire stop system limits use to non-sag grade for both opening conditions.
2. Acceptable Products:
  - a. 3M Fire Protection Products: FireBarrier 2000, 1000NS, or 1003SL Silicone Sealant
  - b. Hilti, Inc.: CP 601S Fire stop Sealant
  - c. Tremco Inc.: Fyre-Sil or Fyre-Sil S/L

**I. Solvent-Release-Curing Intumescent Sealant:**

1. Solvent-release-curing, single-component, synthetic-polymer-based sealant of grade indicated below:
  - a. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces and non-sag formulation for openings in vertical and other surfaces requiring a nonslumping/gunnable sealant, unless indicated fire stop system limits use to non-sag grade for both opening conditions.
2. Acceptable Products:
  - a. 3M Fire Protection Products : Fire Barrier CP 25S/L Caulk
  - b. Rectorseal: Biostop 500 Intumescent Firestop Caulk

**J. Collars.**

1. Acceptable products:
  - a. 3M Fire Protection Products: FireBarrier RC-1 Restricting Collar, FireBarrier Ultra RC Pack, or Ultra Plastic Pipe Device
  - b. Hilti, Inc.: CP 643N or CP 644 Collar
  - c. Rectorseal: Metacaulk Pipe Collar
  - d. Tremco: TREMstop D

**2.03 FIRE-RESISTIVE JOINT SEALANTS****A. Sealants or caulking or spray materials for use with fire-rated construction joints and other gaps.**

1. Acceptable products:
  - a. 3M Fire Protection Products: 2000 Silicone Sealant or FireDam Spray 100
  - b. Hilti Inc.: CP 601s Elastomeric Firestop Sealant or CP 606 Flexible Firestop Sealant or 672 Speed Spray

**B. Pre-formed mineral wool designed to fit flutes of metal profile deck and gap between top of wall and metal profile deck; as a backer for spray material.**

1. Acceptable products:
  - a. Hilti Inc.: CP 777 Speed Plugs or CP 767 Speed Strips
  - b. Thermafiber: Safing Insulation



- C. Mineral wool material behind exterior building sealant (as defined in Section 07901) in rated wall joint assemblies.

1. Acceptable products:
  - a. Backer Rod Mfg. Inc.: Ultra Block
  - b. Hilti Inc.: CP 777 Speed Plugs or CP 767 Speed Strips
  - c. Thermafiber: Safing Insulation

#### 2.04 ACCESSORIES

- A. Provide components for each firestopping system that is needed to install fill materials and to comply with "System Performance Requirements" article in part 1. Use only components specified by the firestopping manufacturer and approved by the qualified testing and inspecting agency for the designated fire-resistance-rated systems. Accessories include, but are not limited to, the following items:

1. Permanent forming/damming/backing materials include the following:
  - a. Semirefractory fiber (mineral wool) insulation.
  - b. Ceramic fiber.
  - c. Sealants used in combination with other forming/damming materials to prevent leakage of fill materials in liquid state.
  - d. Fire-rated form board.
  - e. Joint fillers for joint sealants.
2. Temporary forming materials.
3. Substrate primers.
4. Steel sleeves.

#### 2.05 MIXING

- A. For those products requiring mixing prior to application, comply with firestopping manufacturer's directions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time and other procedures needed to produce firestopping products of uniform quality with optimum performance characteristics for application indicated.

### PART 3 - EXECUTION

#### 3.01 EXAMINATION

- A. Examine substrates and conditions with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates and other conditions affecting performance of firestopping. Do not proceed with installation until unsatisfactory conditions have been corrected.

#### 3.02 PREPARATION

- A. Surface Cleaning: Clean out openings and joints immediately prior to installing firestopping to comply with recommendations of firestopping manufacturer and the following requirements:

1. Remove all foreign materials from surfaces of opening and joint substrates and from penetrating items that could interfere with adhesion of firestopping.
2. Clean opening and joint substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with firestopping. Remove loose particles remaining from cleaning operation.
3. Remove laitance and form release agents from concrete.

- B. Priming: Prime substrates where recommended by firestopping manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

- C. Masking Tape: Use masking tape to prevent firestopping from contacting adjoining surfaces that will remain exposed upon completion of Work and that would otherwise be permanently stained or damaged by such contact, or by cleaning methods used to remove smears from firestopping materials. Remove tape as soon as it is possible to do so without disturbing firestopping's seal with substrates.

#### 3.03 INSTALLING THROUGH-PENETRATION FIRESTOPS

- A. General: Comply with the "System Performance Requirements" article in Part 1 and the through-penetration firestop manufacturer's installation instructions and drawings pertaining to products and applications indicated.
- B. Install forming/damming materials and other accessories of types required to support fill materials during their application and in the position needed to produce the cross-sectional shapes and depths required to achieve fire ratings of designated through-penetration firestop systems. After installing fill materials, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.
- C. Install fill materials for through-penetration firestop systems by proven techniques to produce the following results:

1. Completely fill voids and cavities formed by openings, forming materials, accessories, and penetrating items.
2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
3. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

**3.04 INSTALLING FIRE-RESISTIVE JOINT SEALANTS**

- A. General: Comply the "System Performance Requirements" article in Part 1, with ASTM C 1193, and with the sealant manufacturer's installation instructions and drawings pertaining to products and applications indicated.
  - B. Install joint fillers to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability and develop fire-resistance rating required.
  - C. Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform cross-sectional shapes and depths relative to joint width that optimize sealant movement capability. Install sealants at the same time joint fillers are installed.
  - D. Tool non-sag sealants immediately after sealant application and prior to time skinning or curing begins. Form smooth, uniform beads of configuration indicated or required to produce fire-resistance rating, as well as to eliminate air pockets, and to ensure contact and adhesion of sealants with sides of joint. Remove excess sealant from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.
- 3.05 CLEANING**
- A. Clean off excess fill materials and sealants adjacent to openings and joints as work progresses by methods and with cleaning materials approved by manufacturers of firestopping products and of products in which opening and joints occur.
  - B. Protect firestopping during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated firestopping immediately and install new materials to produce firestopping complying with specified requirements.

**END OF SECTION**

**Construction Specification****JOINT SEALERS/FILLERS****PART 1 - GENERAL****1.01 SUMMARY**

- A. Joint sealers/fillers shall be placed at, but not be limited to, the following locations.
  - 1. Horizontal construction and contraction joints in concrete floor slabs and pavements.
  - 2. Joints in tilt-up or precast panels
  - 3. Joints in concrete curbs
  - 4. Perimeter of doors, windows and other framed wall openings
  - 5. Bed joints for sills, thresholds, flanges and similar items requiring sealant.
  - 6. Any joint where watertight or weathertight sealing is required.
  - 7. Joint between plastic laminate clad backsplashes and wall surfaces.
  - 8. Joints requiring fire stop sealant at precast/tilt-up concrete panels.
- B. Refer to drawings for additional information.

**1.02 SUBMITTALS TO ARCHITECT OF RECORD**

- A. Product Data: Submit manufacturer's detailed technical data for materials and installation.
- B. Submit manufacturer's standard color chart for selection of colors for exposed sealants.

**1.03 DEFINITIONS**

- A. Sealant: A weatherproof elastomer used in filling and sealing joints, having properties of adhesion, cohesion, extensibility to make joint air and watertight. Material is designed for joints at the interior or exterior of structures and to joints subject to movement.
- B. Caulking Compound: A material used in filling joints and seams, having properties of adhesion and cohesion; shall not be required to have extensibility and recovery properties, usually applied to interior joint conditions.
- C. Caulking: The term is used here to denote the process of filling the joints, without regard to type of material.
- D. Joint Filler: semi-rigid, full-depth joint filler capable of withstanding hard wheeled traffic without deflection, to protect the edges of the concrete floor slab from spalling due to impact.

**1.04 SYSTEM PERFORMANCE**

- A. Provide joint sealers that have been produced and installed to establish and maintain watertight and airtight continuous seals.

**1.05 QUALITY ASSURANCE**

- A. Full time special inspection: The Owner will engage the duties of a special inspector for full-time inspection during the installation of the floor joint filler. No work is to proceed unless the special inspector is present.
- B. The Owner's representative shall designate, at his sole discretion, the locations for up to 6 core samples through the completed floor joints for the purpose of ensuring complete penetration into the floor joints of the joint filler. Should any core reveal incomplete penetration of the floor joint filler, the Owner's representative, at his sole discretion, shall delineate the extent of the joint filler to be removed and re-installed in accordance with the specification. Such remedial work shall also be under the observation of the special inspector.
- C. Installer Qualifications: Engage an Installer who is an approved installer of the manufacturer of the material submitted and approved for use in filling the floor joints. Submit a letter from the manufacturer stating approval of the installer prior to the commencement of any work. Any work performed prior to the receipt of the manufacturer's approval letter, or any work performed by an installer not approved by the manufacturer shall be rejected and the work shall be removed and re-installed by the approved installer.
- D. Single Source Responsibility for Joint Sealer Materials: Obtain joint sealer materials from a single manufacturer for each different product required.

**1.06 JOB CONDITIONS**

- A. Weather Condition
  - 1. Install no liquid sealants under wet or freezing conditions or when temperatures are below or above those recommended by manufacturer.
  - 2. Proceed with work only when forecasted weather conditions are favorable for joint cure and development of high early bond strength.
  - 3. Where joint width is affected by ambient temperature variations, install sealants only when temperatures are in lower third of temperature range recommended by sealant manufacturer.

**B. Protection of Adjacent Surfaces**

1. Protect either by applying masking material or manipulating application equipment to keep sealants in joint.
2. If masking materials are used, allow no tape to touch cleaned surfaces to receive sealant. Remove tape immediately after caulking is accomplished and before surface skin begins to form.
3. Remove misapplied sealants from surfaces immediately, using solvents and methods recommended by manufacturer.
4. Restore surfaces from which sealants have been removed to the original condition and appearance.

**PART 2 - PRODUCTS****2.01 MATERIALS, GENERAL**

- A. Compatibility: Provide joint sealers, joint fillers and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by testing and field experience.
- B. Colors: Provide color of exposed joint sealers to match color of adjacent surfaces.
  1. Where adjacent surfaces change color along length of joint, sealant color shall change to match. To ensure adhesion to itself sealant shall not be allowed to dry before different color is applied.
- C. Painting: Sealant shall be allowed to cure in accordance with manufacturer's recommendations prior to painting.
  1. Sealant surface shall be wiped with xylene, or manufacturer's approved solution, which shall be allowed to evaporate before painting.
- D. VOC Compliance: All joint sealer, joint filler and primer products shall be VOC compliant for building location

**2.02 EXTERIOR BUILDING SEALANT**

- A. Application: Exterior joints not subject to seismic movement in vertical and horizontal surfaces.
- B. Exterior Vertical Surfaces: Includes interior joints in concrete tilt-up and concrete masonry unit exterior building walls
  1. Acceptable Products:
    - a. Sika: Sikaflex-2c NS
    - b. Sonneborn (BASF): Sonolastic NP-2
    - c. Tremco: Dymeric 240/240FC
  2. Type of Sealant: Two component polyurethane, Grade NS, Class 25, use NT, M, A and O
  3. Characteristics:
    - a. Hardness 15-50, Shore A
    - b. Color shall be selected from manufacturer's standard colors that closely match the color of the adjacent finished surface.

**2.03 EXPANDING FOAM EXPANSION SEALS**

- A. Application: Exterior structural vertical expansion joints 2" or greater. Refer to construction drawing if and where applicable.
- B. Expanding foam with factory applied facing. Field applied sealant both sides.
- C. Acceptable Products:
  1. Emseal Joint Systems Ltd.: ColorSeal
  2. Watson Bowman Acme Corp.: Wabo WeatherSeal
- D. Color: Standard color to match adjacent wall.

**2.04 GLAZING AND FLASHING SEALANT**

- A. Application: Exterior door and window frames, flashing, reglets, and other miscellaneous small joints.
- B. Acceptable Products:
  1. DAP: Window and Door 100% Silicone Sealant
  2. GE Silicones: SCS1200 Silicone Sealants
- C. Color: Clear
- D. Use also for sealing at intersection of plastic laminate clad backsplashes and wall surfaces.

**2.05 PREFORMED JOINT FILLER**

- A. Firm Preformed Joint Filler
  - 1. ASTM D 1751, non-extruding, full depth of concrete. Used at exterior isolation joints unless noted otherwise.
  - 2. Acceptable products and manufacturers:
    - a. W.R. Meadows: Fibre Expansion Joint
- B. Soft Preformed Joint Filler: Used at interior and exterior column isolation diamonds, interior and exterior isolation joints between building wall and abutting slab or paving.
  - 1. ASTM D3575 or ASTM D1752, with compression of 10 psi to 25 psi, nonextruding, full depth of concrete.
  - 2. Acceptable products and manufacturers:
    - a. WR Meadows: Deck-O-Foam or Ceramar

## 2.06 ELASTOMERIC FLOOR JOINT MATERIALS

- A. Used at building interior over top of Soft Preformed Joint Filler, or at any interior slab joint where sealant is identified in the drawings.
- B. Sealant:
  - 1. FS TT-S-00230, Type I, Class A, single component cold applied, pourable or gun grade, as applicable, polyurethane base.
  - 2. Closely match color of adjacent exposed surface of concrete slab and closely match color of semi-rigid joint filler.
  - 3. Keep same color throughout project.
  - 4. Sealant to be compatible with construction material placed against it.
  - 5. Acceptable products:
    - a. Sika: Sikaflex -1C SL
    - b. Sonneborn (BASF): Sonolastic SL1
- C. Joint Back-Up Material: May be omitted where Soft Preformed Joint Filler provides back-up at the necessary depth. Follow Sealant Manufacturer's recommendations for installation depth of back-up materials.
  - 1. Polyethylene foam, 60% closed cell.
  - 2. Sealant to be compatible with any construction material to be placed against it.

## 2.07 SEMI-RIGID FLOOR JOINT FILLER

- A. Used in saw cuts of interior floor slab at both contraction joint and construction joint locations.
- B. General:
  - 1. Filler to be compatible with construction material placed against it.
  - 2. Closely match color of adjacent exposed surface of concrete slab. Keep same color throughout project.
- C. Epoxy:
  - 1. 100% solids, 2-part with instantaneous Shore A hardness of 85 to 100.
  - 2. Acceptable Products and Manufacturers:
    - a. Euclid Chemical Corp.: Euco 700
    - b. Metzger/McGuire Co.: MM-80
- D. Polyurea Joint Filler
  - 1. Rapid setting, two-component polyurea polymer liquid of 100% solids content, Shore Hardness 85 to 90.
  - 2. Acceptable Products and Manufacturers:
    - a. Metzger/McGuire: RS 88
    - b. Euclid Chemical: Euco QWIKjoint 200 or 300

## 2.08 EXTERIOR SLAB ON GROUND/CONCRETE PAVEMENT SEALANT

- A. Used at exterior Horizontal Surfaces: Includes pavement construction and contraction joints, isolation joint between paving/concrete slab on ground and building wall, and column isolation joints.
- B. Acceptable Products:
  - 1. Dow Corning: 888 or 890-SL Silicone Joint Sealant

## 2.09 MISCELLANEOUS MATERIALS

**Construction Specification****JOINT SEALERS/FILLERS**

- A. Bond Breaker Tape: Polyethylene tape of plastic as recommended by sealant manufacturer, to be applied to sealant-contact surfaces where bond to substrate of joint filler must be avoided for proper performance of sealant.
- B. Primer: Provide Joint Cleaning Compound as recommended by Sealant Manufacturer.
- C. Masking Tape: Provide pressure-sensitive adhesive tape as selected by installer to protect surfaces from damage.
- D. Sealant Backer Rod: Unless specified otherwise, use compressible rod stock polyethylene foam, polyethylene jacketed polyurethane foam, butyl rubber foam, neoprene foam or other flexible, permanent, durable, non-absorptive material as recommended for compatibility with sealant. Provide size and shape of rod which will control the joint depth for sealant placement, break bond of sealant at bottom of joint, form optimum shape of sealant bead on back side, and provide a highly compressible backer to minimize the possibility of sealant extrusion when joint is compressed. Joints in pre-cast or tilt-up walls identified as fire rated on the drawings, shall have mineral wool fire safing or other fire-blocking backup material recommended by the sealant manufacturer as necessary to meet the required fire rating.
- E. Tooling agent: Water xylol, alcohol, warm soapy water or other agent recommended by sealant manufacturer to insure firm, full contact of sealant with inner faces of joint.
- F. Masking tape and similar accessories to protect surfaces from damage.
- G. Stain Preventing Film:
  - 1. Metzger/McGuire: SPF
  - 2. Euclid Chemical: Euco Clean-Cut

**PART 3 - EXECUTION****3.01 INSPECTION**

- A. Inspect joints indicated to receive joint sealers, joint fillers, and/or caulking compound for compliance with requirements for joint configuration, installation tolerances and other conditions affecting joint sealer performance. Do not allow joint sealer work to proceed until unsatisfactory conditions have been corrected.

**3.02 PREPARATION**

- A. Cleaning of Floor Joints: Immediately prior to application of joint materials, re-cut with a concrete saw all floor joints to full depth of initial saw cut. No other method shall be employed in cleaning out the floor joints prior to the installation of the filler. Remove loose particles remaining from above cleaning operations by vacuuming. Ensure dirt, debris, saw laitance, release agent, curing compound, other foreign material are removed from full depth of joint.
- B. Surface Cleaning of Joints: Clean out joints immediately before installing joint materials to comply with the recommendations of the joint materials manufacturer and the following requirements:
  - 1. Remove all foreign material from joint substrates which could interfere with adhesion of the joint material, including dust; paints, except for permanent, protective coatings tested and approved for joint material adhesion and compatibility by joint material manufacturer; oil; grease waterproofing; water repellents; water; surface dirt and frost.
  - 2. Clean concrete, masonry and similar porous joint substrate surfaces, by brushing, grinding, blast cleaning, mechanical abrading, acid washing or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealers. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
  - 3. Remove laitance and form release agents from concrete.
  - 4. Clean metal, glass, porcelain enamel, glazed surfaces of ceramic tile and other non-porous surfaces by chemical cleaners or other means which are not harmful to substrates or leave residues capable of interfering with adhesion of joint materials.
- C. Joint Priming: Prime joint substrates where recommended by joint material manufacturer based on preconstruction joint material-substrate tests or prior experience. Apply primer to comply with joint material manufacturer's recommendations. Confine primers to areas of joint material bond. Do not allow spillage or migration onto adjoining surfaces.
- D. Masking Tape: Use masking tape where required to prevent contact of joint material with adjoining surfaces which otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove joint material smears. Remove tape immediately after tooling without disturbing joint material.
- E. Stain Preventing Film: Use stain preventing film to protect slab surfaces from contact with semi-rigid joint filler. Follow manufacturer's application instructions. Do not use tape to protect slab surfaces from contact with semi-rigid joint filler.

**3.03 INSTALLATION OF JOINT SEALERS AND FILLERS**

- A. General:
  - 1. Comply with joint sealer, filler, and caulking manufacturer's printed installation instructions applicable to products and

- applications indicated, except where more stringent requirements apply.
2. Install joint sealer/filler just prior to substantial completion, unless noted otherwise.
- B. Seal/fill contraction, isolation and construction joints in floor slabs and pavements, unless otherwise indicated on the drawings or specified herein.
- C. For interior slabs, use semi-rigid joint filler in contraction and construction joints, and use elastomeric joint sealant in isolation joints, unless noted otherwise.
- D. For exterior slabs/concrete pavement, use pavement sealant in contraction joints, construction joints, and isolation joints. Apply sealant over a properly installed backer rod in accordance with the manufacturers recommendations.
- E. Do not seal joints with materials specified herein when below relatively impervious floor finish material.
- F. Elastomeric Joint Sealant Installation:
1. General, Unless noted otherwise herein or on the drawings
    - a. Use joint back-up material.
    - b. Tool surface to provide smooth, attractive appearance and geometry recommended by sealant manufacturer.
  2. Construction or contraction joints in concrete pavement/exterior slabs on ground
    - a. Finish joint surface as indicated in the drawing details.
- G. Semi-rigid Joint Filler Installation:
1. Do not use joint back-up material (i.e., backer rod, sand, etc.), except below bottom of saw cut shelf in construction joints.
  2. Apply joint filler stain preventing film on both sides of joints.
  3. Initially fill joints with semi-rigid epoxy joint filler at the earliest point in time permitted by the manufacturer. Completely fill joints in two passes, if needed, to produce a slight crown.
  4. Remove excess filler from exposed concrete surface prior to it setting.
  5. Add extra filler prior to setting, if needed to prevent depressed areas.
  6. After curing, razor off crown so filler is flush with the adjacent concrete surfaces.
  7. Immediately remove stain preventing film after shaving joint filler. Follow the manufacturer's instructions for removal.
  8. No joint filling is to occur without the supervision and observation of the Owner's special inspector.
  9. Repair joints just prior to turnover with semi-rigid polyurea joint filler as defined below. Come back just before end of warranty period, or as directed by Owner's Representative, to repair joints again with semi-rigid polyurea joint filler. All repairs to be monitored by the Owner's special inspector, unless noted otherwise.
    - a. Full Depth Repair
      - i. Required where the joint filler is shallow (concave or below the adjacent concrete floor surface), where the joint filler has separated from the concrete on both sides of the joint, or where the joint filler is less than full depth as shown in core samples or as shown by random sampling via removal.
        - a). Remove joint filler material for the full depth of the joint for the length of the joint determined by the Owner's Representative. Ensure all joint filler residue on joint walls is removed back to clean concrete.
        - b). Blow out the joint with oil-free compressed air and vacuum clean.
        - c). Apply joint filler stain preventing film on both sides of joints.
        - d). Completely fill joint two passes, if needed, to produce a slight crown.
        - e). After curing, razor off crown so filler is flush with the adjacent concrete surfaces.
        - f). Immediately remove stain preventing film after shaving joint filler. Follow the manufacturer's instructions for removal.
      - b. Partial Depth Repair
        - i. Required where splits in the joint material are visible or the joint material has separated from the concrete on one side of the joint, but the criteria for full depth repair are not met.
          - a). Remove the top ½ inch minimum of joint filler for the length of the joint determined by the Owner's Representative. Ensure all joint filler residue on joint walls is removed back to clean concrete.
          - b). Blow out the joint with oil-free compressed air and vacuum clean.
          - c). Apply joint filler stain preventing film on both sides of joints.
          - d). Completely fill joint producing a slight crown.
          - e). After curing, razor off crown so filler is flush with the adjacent concrete surfaces.
          - f). Immediately remove stain preventing film after shaving joint filler. Follow the manufacturer's instructions for removal.
- H. Installation of Sealant Backings: Install sealant backings to comply with the following requirements.
1. Install joint-backing of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
    - a. Do not leave gaps between ends of joint-backings.
    - b. Do not stretch, twist, puncture or tear joint-backings
    - c. Remove absorbent joint-backings, which have become wet prior to sealant application and replace with dry material.

- I. Install bond breaker tape between sealants back of joints where required to prevent third-side adhesion of sealant to back of joint.
- J. Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration and providing uniform, cross-sectional shapes and depths relative to joint widths which allow optimum sealant movement capability.
- K. Tooling of Non sag Sealants: Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents, which discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.

#### 3.04 PROTECTION AND CLEANING

- A. Protect joint materials during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that curing is ensured per manufacturer's recommendations without deterioration or damage at time of substantial completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint materials immediately and refill joints with new materials to produce joint materials installations with required areas indistinguishable for original work.
- B. Clean off excess joint materials or smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint material and of products in which joints occur.
- C. Immediately prior to sealing/filing, clean joints to full depth of sealant/filler in accordance with manufacturer's recommendations.
- D. Remove form release agent, curing compound or other contaminants.

END OF SECTION



**Construction Specification****(FBO) HOLLOW METAL DOORS AND FRAMES (DH PACE)****PART 1 - GENERAL****1.01 SUMMARY**

- A. Extent of steel doors and fully welded frames is indicated and scheduled on drawings.
- B. Related work specified elsewhere
  - 1. Section 01010 - Furnished By Owner Items (FBO)
  - 2. Section 08700 - Finish Hardware
  - 3. Section 08800 - Glass and Glazing
  - 4. Section 09900 - Painting

**1.02 REFERENCES**

- A. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
- B. ASTM A568 - Standard Specification for Steel Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for.
- C. ASTM A1008 - Standard Specification for Steel Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
- D. ASTM A1011 - Standard Specification for Steel Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
- E. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frame Anchors and Hardware Reinforcings.
- F. ANSI/SDI A250.6 Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.
- G. ANSI/SDI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.
- H. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
- I. ANSI/SDI A250.11 - Recommended Erection Instructions for Steel Frames (Formerly SDI-105).
- J. ANSI/SDI A250.13 - Testing and Rating of Severe Windstorm Resistant Components for Swinging Door Assemblies.
- K. DHI A115.1G - Installation Guide for Doors and Hardware.
- L. SDI 111 - Recommended Selection and Usage Guide for Standard Steel Doors, Frames, and Accessories.
- M. ANSI/NFPA 252 - Fire Tests of Door Assemblies.
- N. ANSI/UL 10B - Fire Tests of Door Assemblies.
- O. ANSI/UL 10C - Positive Pressure Fire Tests of Door Assemblies.
- P. ANSI/UL 1784 - Air Leakage Tests of Door Assemblies
- Q. UL - Building Materials Directory; Underwriters Laboratories Inc.
- R. WH - Certification Listings; Warnock Hersey International Inc.
- S. NFPA 80 - Fire Doors and Fire Windows.

**1.03 FBO PROCEDURES**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section. General requirements related to Furnished by Owner (FBO) Items are as defined in Section 01010. All FBO Forms listed below are included as part of Section 01010.
- B. Vendor Contact: Contractor shall send a completed "FBO Form A: Contractor Information Form" to the FBO vendor indicated below, twelve (12) weeks prior to the scheduled installation of the specified system:

D.H. Pace Door Services (D.H. Pace Company, Inc.)  
 218 East 11th Avenue  
 North Kansas City, MO 64116  
 Contact: **Brad Thomas**  
 Phone: (888) 643-3667 or (816) 480-2600; Fax: (816) 480-2658  
 E-mail: [brad.thomas@dhpac.com](mailto:brad.thomas@dhpac.com) or [homedepot@dhpac.com](mailto:homedepot@dhpac.com)

- C. Take-Offs: FBO Vendor shall provide "take-offs" to the Contractor as specified in Section 01010. The Contractor shall then verify this "take-off" using an "FBO Form B: Take-Off Confirmation Sheet".
- D. Receipt of Shipment: Contractor shall verify shipment per the requirements of Section 01010 and complete the "FBO Form C: Confirmation of Shipment" and submit back to the FBO vendor.
- E. Request for Changes: Changes to materials and quantities after receipt of shipment shall be coordinated by the contractor with the FBO vendor per the requirements of Section 01010 using an "FBO Form D: Request For Additional/Replacement Materials".
- F. Return Merchandise Authorization Policy: The Home Depot will add to the contractors' scope of work the responsibility for coordinating (1) customer accommodation return request through the FBO Vendor. Requests shall be submitted using the "FBO Form E: Returned Materials" as specified in Section 01010.

**1.04 SUBMITTALS TO GENERAL CONTRACTOR**

- A. A copy of the "bid set" construction documents will be forwarded to FBO supplier from Architect of Record. FBO supplier

**Construction Specification (FBO) HOLLOW METAL DOORS AND FRAMES (DH PACE)**

will complete initial "take-off" indicating all materials to be shipped. FBO supplier will confirm the order with The Home Depot representative within 20 days of the receipt of construction documents.

1. General Contractor will receive complete "submittal package" indicating all materials to be shipped. General Contractor is then responsible for confirming the submitted materials and quantities with the plans and specifications. A return confirmation must be sent back to FBO supplier for final coordination of package contents.
2. FBO supplier is solely responsible for correctness of shipped materials and quantities.

**1.05 QUALITY ASSURANCE**

- A. Provide doors and frames complying with Steel Door Institute "Recommended Specifications: Standard Steel Doors and Frames" ANSI/SDI A250.8 (SDI-100) and as herein specified.
- B. Fire-Rated Door Assemblies: Where fire-rated door assemblies are indicated or required, provide fire-rated door and frame assemblies that comply with NFPA 80 "Standard for Fire Doors and Windows", and have been tested, listed, and labeled in accordance with ANSI/NFPA 252, UL10B or UL10C. Provide label by Underwriters Laboratory (UL), Warner Hersey (WH), or another nationally recognized independent testing and inspection agency acceptable to authorities having jurisdiction.
- C. Hurricane Resistant Door Assemblies: Where hurricane resistant door assemblies are indicated, refer to drawings for testing approval(s) required.

**1.06 DELIVERY, STORAGE AND HANDLING**

- A. Deliver welded hollow metal frames with temporary spreader bars. Ship hollow metal doors individually wrapped in cardboard and palletized.
- B. Inspect items upon delivery. Reject damaged items.
- C. Store doors and frames at building site under cover. Place units on minimum 4" high wood blocking. Avoid use of non-vented plastic or canvas shelters that could create humidity chamber. If cardboard wrapper on door becomes wet, remove carton immediately and inspect item. Provide 1/4" spaces between stacked doors to promote air circulation.

**PART 2 - PRODUCTS****2.01 MANUFACTURER**

- A. Curries or approved equivalent.
  1. Manufacturer: Subject to compliance with requirements, provide steel doors and frames by a current member of the Steel Door Institute (SDI).

**2.02 MATERIALS**

- A. Hot-Rolled Steel Sheets and Strip: Commercial quality carbon steel, pickled and oiled, complying with ASTM A1011 and ASTM A568 containing a minimum of 20% recycled steel.
- B. Cold-Rolled Steel Sheets: Commercial quality carbon steel, complying with ASTM A1008 and ASTM A568 containing a minimum of 20% recycled steel.
- C. Supports and Anchors: Fabricate of not less than 18-gage galvanized sheet steel.
- D. Inserts, Bolts, and Fasteners: Manufacturer's standard units, except hot-dip galvanize items to be built into exterior walls, complying with ASTM A153, Class C or D as applicable.
- E. Primer: One coat of rust-inhibitive enamel or paint, either air-drying or baking, VOC compliant for building location, suitable as a base for specified finish paints. Use water based primer where available.

**2.03 FABRICATION, GENERAL**

- A. Fabricate steel door and frame units to be rigid, neat in appearance and free from defects, warp or buckle to comply with ASTM/SDI A250.4 and ASTM/SDI A250.8. Wherever practicable, fit and assemble units in manufacturer's plant.
- B. Fabricate exterior doors, panels, and frames from cold rolled sheet steel. Close top and bottom edges of exterior doors as integral part of door construction or by addition of minimum 16 gage inverted steel channels.
- C. Fabricate frames, reinforcement, edge channels, louvers and moldings from either cold-rolled or hot-rolled steel (at fabricator's option).

**Construction Specification****(FBO) HOLLOW METAL DOORS AND FRAMES (DH PACE)****2.04 STEEL DOORS**

- A. Clearly identify work that cannot be permanently factory-assembled before shipment, to assure proper assembly at project site. Comply with ANSI/SDI A250.8 requirements as follows:
  - 1. Doors: Level III - Model 2, Extra Heavy-Duty, minimum 16-gage faces.
- B. Fabricate exposed faces of doors from only stretcher level cold-rolled steel.
- C. Cap top of all exterior doors with flush screw-in cap.
- D. Thermal-Rated (Insulating) Assemblies:
  - 1. At exterior locations and elsewhere as shown or scheduled, provide doors that have been fabricated as thermal insulating door and frame assemblies.
    - a. Unless otherwise indicated, provide thermal-rated assemblies with U factor of 0.24 Btu/(hr.ft<sup>2</sup>.°F) or better.
    - b. Polystyrene or polyurethane core is acceptable.
- E. Finish Hardware Preparation: Prepare doors and frames to receive mortised and concealed finish hardware in accordance with final Finish Hardware Schedule and templates provided by hardware supplier. Refer to SDI 111 for door and frame preparation for hardware.
  - 1. Reinforce doors and frames to receive surface-applied hardware per ANSI/SDI A250.6. Drilling and tapping for surface-applied finish hardware may be done at project site.
  - 2. Locate finish hardware as indicated on final shop drawings or, if not indicated, in accordance with "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames (latest version) ", published by Door and Hardware Institute.

**2.05 STEEL FRAMES**

- A. Provide metal frames for doors, of types and styles as shown on drawings and schedules. Conceal fastenings.
- B. Fabricate exterior and interior frames with mitered corners. Weld tabs and faceweld mitered corners.
- C. Form exterior frames of 16 gage A60 galvanized steel. Form interior frames of: 16 gage cold rolled steel per ASTM A1008.
- D. Door Silencers: Except on weatherstripped frames, drill stops to receive 3 silencers on strike jambs of single-swing frames and 2 silencers on head of double-swing frames.
- E. Plaster Guards: Provide 26 gage steel plaster guards or mortar boxes, welded to frame, at back of finish hardware cutouts where mortar or other materials might obstruct hardware operation and to close off interior of openings.
- F. Anchors: Floor anchors to be provided at each jamb.

**2.06 FINISH**

- A. Preparation:
  - 1. Clean, treat, and paint exposed surfaces of steel door and frame units.
  - 2. Clean steel surfaces of mill scale, rust, oil, grease, dirt, and other foreign materials before application of paint per ANSI/SDI A250.10.
- B. Prime Painting
  - 1. Apply shop coat of prime paint of even consistency to provide a uniformly finished surface ready to receive finish paint.
  - 2. Thickness is 0.9 to 1.2 mils.
  - 3. Refer to Section 09900 for painting of exterior ferrous metals

**2.07 LOUVERS**

- A. Provide sight proof stationary louvers for interior doors where indicated, constructed of inverted V-shaped or Y-shaped blades formed of 18 gauge cold-rolled steel. Space blades to provide not less than 20% free air opening.
- B. For fire-rated openings, provide tightly fitted, spring loaded, automatic closing louvers with operable blades, equipped with fusible links, arranged so that metal overlaps metal at every joint. Where approved by local AHJ.

**PART 3 - EXECUTION****3.01 INSTALLATION**

- A. General: Install standard steel doors, frames, and accessories in accordance with final shop drawings, manufacturer's data,

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**Construction Specification (FBO) HOLLOW METAL DOORS AND FRAMES (DH PACE)**

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ANSI/SDI A250.11, DHI A115.1G, and as herein specified.

- B. Placing Frames: Comply with provision of ANSI/SDI A250.11 or as otherwise required by manufacturer's recommendations.
  - 1. At masonry and concrete construction coat entire inside surface of frames with asphaltic paint to reduce corrosion.
  - 2. At Concrete Tilt-Up Panel Construction, hollow metal frames *must* be set and secured in place prior to pouring of panel.
  - 3. In masonry construction, locate 3 wall anchors per jamb at hinge and strike levels.
  - 4. At in-place masonry construction, set frames and secure to adjacent construction with machine screws and masonry anchorage devices.
  - 5. Install fire-rated frames in accordance with NFPA 80.
  - 6. In metal stud partition, install at least 3 wall anchors per jamb at hinge and strike levels. In open steel stud partitions, place studs in wall anchor notches and wire tie. In closed steel stud partitions, attach wall anchors to studs with self-tapping screws.
- C. Door Installation:
  - 1. Fit hollow metal doors accurately in frames, within clearances specified in ANSI/SDI A250.8.
  - 2. Place fire-rated doors with clearances as specified in NFPA 80.
- D. Prime Coat Touch-up: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.

### 3.02 ADJUST AND CLEAN

- A. Final Adjustments: Check and readjust operating finish hardware items, leaving steel doors and frames undamaged and in complete and proper operating condition.

END OF SECTION

**Construction Specification****(FBO) OVERHEAD COILING DOORS (CORNELL)****PART 1 - GENERAL****1.01 SUMMARY**

- A. Extent of overhead coiling doors is shown on drawings.
- B. The scope of work shall include making all modification requirements as shown on the drawings for installation of overhead coiling doors.
- C. Related Work:
  - 1. Section 01010 - Furnished By Owner Items (FBO)
  - 2. Section 05501 - Metal Fabrications
  - 3. Section 08710 - Finish Hardware
  - 4. Division 16 - Electrical power to equipment, disconnect switches, conduit, wire and wiring of electrical operators

**1.02 FBO PROCEDURES**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section. General requirements related to Furnished by Owner (FBO) Items are as defined in Section 01010. All FBO Forms listed below are included as part of Section 01010.

- B. FBO Vendor Contact: General Contractor shall send a completed "FBO Form A: Contractor Information Form" to the FBO Vendor indicated below, twelve (12) weeks prior to the scheduled installation of the specified system:

Cornell Storefront Systems  
 140 Maffet Street, Suite 200  
 Wilkes-Barre, PA 18705  
 Contact: David Alexander or Dan Broda  
 Phone: (800) 882-6773  
 Fax: (800) 882-6772  
 e-mail: [dalexander@cornellstorefronts.com](mailto:dalexander@cornellstorefronts.com) or [dbroda@cornellstorefronts.com](mailto:dbroda@cornellstorefronts.com)

- C. Take-Offs: FBO Vendor shall provide "take-offs" to the General Contractor as specified in Section 01010. The General Contractor shall then verify this "take-off" using an "FBO Form B: Take-Off Confirmation Sheet".
- D. Receipt of Shipment: General Contractor shall verify shipment per the requirements of Section 01010 and complete the "FBO Form C: Confirmation of Shipment" and submit back to the FBO Vendor.
- E. Request for Changes: Changes to materials and quantities after receipt of shipment shall be coordinated by the General Contractor with the FBO Vendor per the requirements of Section 01010 using an "FBO Form D: Request For Additional/Replacement Materials".
- F. Return Merchandise Authorization Policy: The Home Depot will add to the General Contractor's scope of work the responsibility for coordinating (1) customer accommodation return request through the FBO Vendor. Requests shall be submitted using the "FBO Form E: Returned Materials" as specified in Section 01010.

**1.03 DESIGN REQUIREMENTS**

- A. Wind Loading: Design doors to withstand a minimum 30 PSF wind load or as required by local code, whichever is greater. Refer to drawings for design wind load.
- B. Cycle Life:
  - 1. All chain-operated doors shall be designed for "standard" operation. [20 cycles per day, 365 days per year]
  - 2. All motor operated doors shall be designed for "high cycle" operation. [50 cycles per day, 365 days per year]

**1.04 SUBMITTALS TO GENERAL CONTRACTOR**

- A. A copy of the "bid set" construction documents will be forwarded to FBO Vendor from Architect of Record via Expesite. FBO Vendor will complete initial "take-off" indicating all materials to be shipped. FBO Vendor will confirm the order with The Home Depot representative within 20 days of the receipt of construction documents.
  - 1. General Contractor will receive complete "submittal package" indicating all materials to be shipped. General Contractor is then responsible for confirming the submitted materials and quantities with the plans and specifications. A return confirmation must be sent back to FBO Vendor for final coordination of package contents.
  - 2. FBO Vendor is solely responsible for correctness of shipped materials and quantities.

**1.05 QUALITY ASSURANCE**

**Construction Specification****(FBO) OVERHEAD COILING DOORS (CORNELL)**

- A. Provide each overhead coiling door as a complete unit produced by one manufacturer including guides, brackets, shaft, hood, curtain, bottom bar, operator, hardware, and installation accessories to suit openings and headroom requirements.
- B. Furnish overhead coiling door units by one manufacturer for the entire project.
- C. Manufacturer shall be ISO 9001:2000 registered.
- D. Installer Qualifications: Manufacturer's approval.

**1.06 DELIVERY, STORAGE AND HANDLING**

- A. The FBO Vendor will be responsible for off-loading the overhead coiling doors. If delivery complications should arise, the General Contractor will be responsible to coordinate safe off-loading and storage of doors.
- B. Deliver materials and products in labeled protective packages. Store and handle in strict compliance with manufacturers instructions and recommendations. Protect from damage from weather, excessive temperatures and construction operations.

**1.07 WARRANTY**

- A. Standard Warranty: Two (2) years from date of shipment against defects in material and workmanship.

**PART 2 - PRODUCTS****2.01 MANUFACTURER**

- A. Furnish the following doors. Refer to construction documents for location and door type.
  - 1. "WeatherGard Plus" Coiling Doors as manufactured by Cornell Iron Works
  - 2. "RapidResponse" Coiling Doors as manufactured by Cornell Iron Works

**2.02 MATERIALS**

- A. Curtain:
  - 1. Slats: No. 5F, ASTM A 653 (A 653M), Commercial Quality, galvanized steel with Z 275 zinc coating.
  - 2. "WeatherGard Plus" Bottom Bar: The bottom slat of curtain to be reinforced by a bottom bar consisting of two steel angles with flexible connecting members.
  - 3. "RapidResponse" Bottom Bar: The bottom slat of curtain to be reinforced by an impactable bottom bar consisting of two steel angles with flexible connecting members.
  - 4. Fabricate interlocking sections with high strength nylon, stamped steel or cast iron endlocks on alternate slats each secured with two 1/4-inch (6.35 mm) rivets. Provide windlocks as required to meet specified wind load. For all exterior overhead coiling doors, provide coated or non-rusting endlocks to prevent excessive rusting.
  - 5. RapidResponse curtains to be provided with a predetermined quantity of additional slats and removable endlocks.
- B. Guides:
  - 1. Fabricate with structural steel angles. Provide windlock bars of same material when windlocks are required to meet specified wind load. Top of inner and outer guide angles to be flared outwards to form bellmouth for smooth entry of curtain into guides. Provide removable guide stoppers to prevent over travel of curtain and bottom bar.
  - 2. RapidResponse guides to feature removable sections at the top and bottom of each.
- C. Counterbalance Shaft Assembly:
  - 1. Barrel: Steel pipe capable of supporting curtain load with maximum deflection of 0.03 inches per foot (2.5 mm per meter) of width.
  - 2. Spring Balance: Oil-tempered, heat-treated steel helical torsion spring assembly designed for proper balance of door to ensure that maximum effort to operate will not exceed 30 pounds. Provide wheel for applying and adjusting spring torque.
  - 3. High cycle doors shall include high cycle springs and barrel construction.
- D. Brackets: Fabricate from minimum 3/16 inch (5 mm) steel plate with permanently lubricated ball or roller bearings at rotating support points to support counterbalance shaft assembly and form end closures.
- E. Hood: 24 gauge galvanized steel, with reinforced top and bottom edges. Provide minimum 1/4-inch (6.35 mm) steel intermediate support brackets as required to prevent excessive sag.
- F. Fascia (when required): 24 gauge galvanized steel, with reinforced top and bottom edges. Provide minimum 1/4-inch (6.35 mm) steel intermediate support brackets as required to prevent excessive sag.

**Construction Specification****(FBO) OVERHEAD COILING DOORS (CORNELL)**

## G. Weatherstripping:

1. Bottom Bar:
  - a. Chain Operated Doors: Replaceable, compressible vinyl gasket or vinyl covered foam gasket extending into guides.
  - b. Motor Operated Doors: Weather/sensing edge within neoprene or rubber astragal extending full width of door bottom bar.
2. Guides: Vinyl strip sealing against fascia side of curtain.
3. Hood: Neoprene/rayon or canvas baffle to impede airflow above coil.

## 2.03 ACCESSORIES

## A. Locking:

1. Manual Push-Up: Padlockable slide bolt on specified side of bottom bar at each jamb extending into slots in guides.
2. Manual Chain Hoist: Padlockable chain keeper on guide. [Padlocks by others]
3. Motor Operator: Padlockable chain keeper on guide. [Padlocks by others]

## B. Operator and Bracket Mechanism Cover:

1. Exterior mounted units: Provide 24 gauge galvanized steel sheet metal cover to provide weather resistance. Finish to match door hood.
2. Low headroom units: Provide 24 gauge galvanized steel sheet metal cover to enclose exposed moving operating components at coil area of unit. Finish to match door hood.
3. EXPOSED MOVING OPERATOR COMPONENTS LOWER THAN 8 FEET ABOVE FLOOR LEVEL THAT CREATE POSSIBLE PINCH POINTS ARE REQUIRED TO BE COVERED PER UL 325. SPECIFY AN OPERATOR COVER WHENEVER THIS FIELD CONDITION EXISTS.

## 2.04 FINISH

## A. Bottom bar, Guides, and Brackets:

1. Phosphate treatment followed by baked-on polyester powder coat; minimum 2.5 mils (0.065 mm) cured film thickness; ASTM D-3363 pencil hardness: H or better.

## B. Slats, Hood and Fascia:

1. Exposed Primer (Precoat): Bonderized coating for prime coat adhesion. Corrosion inhibiting primer .2 mils per side. Thermo-setting top coat with a minimum thickness of .6 mils each side.
2. Powder Coating (black perforated only): Phosphate treatment followed by baked-on polyester powder coat; minimum 2.5 mils (0.065 mm) cured film thickness; ASTM D-3363 pencil hardness: H or better.
3. Refer to Colors sub-section below for approved finishes per color.

## C. Color: as specified in drawings

1. Exposed primer coat (Precoat) approved colors:
  - a. "Standard Tan Primed" approved match to "Manilla Tan" (RAL 1015)
  - b. "Standard Gray Primed" approved match to "Cool Grey" (RAL 7045)
  - c. "Standard Orange Primed" approved match to "Home Depot Orange" (RAL 2009)
2. Cornell SpectraShield powder coat colors:
  - a. "Traffic Black" (RAL 9017) (perforated garden center doors only if specified in drawings)
3. No other colors shall be provided. Refer to drawings.

## 2.05 OPERATION

## A. Provide specific operation per door as specified in drawings

## B. Manual Push-Up: Provide lift handles on bottom bar and pole with hook.

## C. Manual Chain Hoist: Provide chain hoist operator with endless steel chain, chain pocket wheel and guard, geared reduction unit, and chain keeper secured to guide.

1. Doors shall be geared to open and close with a maximum of 30 pounds of effort.

## D. Motor (when specified): Supply Model GH, heavy duty, UL listed, gearhead hoist type operator(s) rated at 1-1/2 H.P., 460Vac, 3-phase. Provide UL listed electric door operator assembly of size, and capacity recommended by door manufacturer for each door opening size and operation requirement, complete with electric motor and factory pre-wired motor controls, worm-gear reduction unit, solenoid operated brake, 3-button OPEN/CLOSE/STOP with key lockout control station. Motor shall be high starting torque, continuous duty, industrial type, and protected against overload by a current sensing or thermal overload device. Speed reduction shall be worm-gear-in-oil-bath gear reducer with synthetic "All Climate" oil. Shall provide 45:1 speed reduction. Door drive shall utilize minimum #50 roller chain and sprockets.

**Construction Specification****(FBO) OVERHEAD COILING DOORS (CORNELL)**

Operator shall be equipped with an electrically interlocked floor level disconnect and chain hoist for manual operation and an electric solenoid-actuated brake to stop the motor and hold the door in position. Operator shall be capable of driving the door at a speed of 8 to 9 inches per second (20 to 23 cm/sec). Fully adjustable, driven linear type limit switch mechanism shall synchronize the operator with the door. Low friction nylon limit nuts fitted on threaded steel shaft, rotating on oilite self-lubricating bronze bushings. The motor shall be removable without affecting the limit switch settings. Verify all electrical requirements with electrical drawings and specifications.

1. Motor Controls: Controls by MMTC, Inc., to be furnished by door manufacturer
  - a. Two (2) NEMA 4 three button station with keyed control box (Model 3BLR Exterior) to be mounted on the interior and exterior at each motor operated door. Key control box is to be provided with a "Best" mortise cylinder and cam. Final key core provided by others.
  - b. The electrical contractor shall mount the push button station and supply the appropriate main power disconnect switch and all conduit and wiring in accordance with the wiring diagram supplied by the door manufacturer.
2. Two (2) UL listed one button remote controllers, Model 3098, with surface mounting bracket for installation at registers No. 1 & 2, and one UL listed receiver Model 1090, for installation at door control panel, [for lumber doors only]
3. Motor Operation – controls shall be factory wired to terminal strip to operate door per the following:
  - a. If the open button is pushed in the down position the door will raise to the fully open position and cannot be stopped until it completes the up cycle.
  - b. If the close button is pushed with the door in the up position the door will close. If the open button is pushed while the door is closing, the door will reverse. If the stop button is pushed while the door is closing, the door will stop.
4. Detector/Sensing Edge: Motor operated doors to be provided with automatic reversing control by an automatic sensing switch with neoprene or rubber astragal extending full width of door bottom bar.
  - a. Contact before door fully closes shall cause door to immediately stop downward travel and reverse direction to the fully opened position per UL Bulletin 325. Provide retracting safety cord and reel connection to control circuit. NOTE: Pneumatic safety edges will not be accepted.
  - b. Sensor Systems:
    - i. Provide Electric Sensing Edge
5. Exterior Mounted Motors: For exposed exterior installation of electric motor, provide 24 gauge sheet metal motor cover.

**PART 3 - EXECUTION****3.01 EXAMINATION**

- A. Examine substrates upon which work will be installed and verify conditions are in accordance with approved shop drawings.
- B. Coordinate with responsible entity to perform corrective work on unsatisfactory substrates.
- C. Commencement of work by installer is acceptance of substrate.

**3.02 INSTALLATION**

- A. General: Install door and operating equipment with necessary hardware, anchors, inserts, hangers and supports.
- B. Follow manufacturer's installation instructions.

**3.03 ADJUSTING**

- A. Following completion of installation, including related work by others, lubricate, test, and adjust doors for ease of operation, free from warp, twist, or distortion.

**3.04 CLEANING**

- A. Clean surfaces soiled by work as recommended by manufacturer.
- B. Remove surplus materials and debris from the site.

**3.05 DEMONSTRATION**

- A. Demonstrate proper operation to Owner's Representative.
- B. Instruct Owner's Representative in maintenance procedures.

**END OF SECTION**



**Construction Specification****ALUMINUM ENTRANCES AND STOREFRONTS****PART 1 - GENERAL****1.01 SUMMARY**

- A. Extent of aluminum doors and framing is indicated on drawings and schedules.
- B. Aluminum entrance and storefront types required for the project include:
  - 1. Exterior frames.
  - 2. Exterior doors (if required).
- C. Related work specified elsewhere includes, but may not be limited to:
  - 1. Section 08800.- Glass and Glazing
  - 2. Section 08700 - Finish Hardware

**1.02 PERFORMANCE REQUIREMENTS**

- A. Performance Requirements: Provide aluminum door and framing assemblies that comply with specified performance characteristics.
  - 1. Thermal Movement: Provide systems capable of withstanding thermal movements resulting from an ambient temperature range of 120 deg. F (67 deg. C), that could cause a metal surface temperature range of 180 deg. F (100 deg. C) within the framing system.
  - 2. Wind Loading: Provide exterior assemblies capable of withstanding a uniform test pressure of 20 psf in a positive and negative direction in accordance with ASTM E 300, with a deflection limit of L/175 of any framing member or 3/4" whichever is less. At a structural test load equal to 1.5 times the specified design load, no glass breakage or permanent set in the framing members in excess of 0.2% of their clear spans shall occur.
    - a. Provide higher test pressures when required by authorities having jurisdiction or as necessary to meet local wind conditions.
- B. Fixed Framing Transmission Characteristics: Provide aluminum entrance and storefront framing system that complies with requirements indicated for transmission characteristics.
  - 1. Air Infiltration: Provide framing system with an air infiltration rate of not more than 0.06 CFM per sq. ft. of fixed area (excluding operable door edges) when tested in accordance with ASTM E 283 at an inward test pressure differential of 6.24 psf.
  - 2. Water Penetration: Provide framing systems with no water penetration (excluding operable door edges) as defined in the test method when tested in accordance with ASTM E 331 at an inward test pressure differential of 6.24 lb. per sq. ft. as defined in AAMA 501.
  - 3. Thermal Transmittance (U-value): When tested to AAMA Specification 1503, the thermal transmittance (U-value) shall not be more than:
    - a. Glass to Exterior -0.61
    - b. Glass to Center -0.61
    - c. Glass to Interior -0.56
  - 4. Condensation Resistance (CRF): When tested to AAMA Specification 1503, the condensation resistance factor shall not be less than:
    - a. Glass to Exterior -69 frame and 58 glass
    - b. Glass to Center -60 frame and 58 glass
    - c. Glass to Interior -54 frame and 58 glass

**1.03 QUALITY ASSURANCE**

- A. Single Source Responsibility: Provide doors and framing produced by a single manufacturer capable of showing prior production of units similar to those required.
- B. Manufacturer's Qualifications: Provide doors and framing produced by a single manufacturer with not less than 5 years successful experience in the fabrication of assemblies of the type and quality required.
- C. Installer's Qualifications: Doors and framing shall be installed by a firm that has not less than 5-years successful experience in the installation of systems similar to those required.

**1.04 SUBMITTALS TO ARCHITECT OF RECORD**

- A. Shop Drawings: For fabrication and erections of each metal fabrication indicated. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items. Provide details for anchors and bolts specified for installation.
- B. Product Data: Submit manufacturers product data and installation instructions for each type of product. Include both published data and any specific data prepared for this project.

**PART 2 - PRODUCTS**

**Construction Specification****ALUMINUM ENTRANCES AND STOREFRONTS****2.01 MANUFACTURERS**

- A. Manufacturer: Subject to compliance with requirements, provide products of the following:
1. Kawneer Company, Inc.;
    - a. IR 500 Framing system – 2-1/2" x 5" nominal dimension; Center; Screw Spline Fabrication (use for infills 9/16" thick)
    - b. IR 501 Framing system – 2-1/2" x 5" nominal dimension; Center; Screw Spline Fabrication (use for infills 1-5/16" thick)
  2. Oldcastle Building Envelope
    - a. FG 5000 Center glazed – 2-1/2" x 5" nominal dimension; (use for infills 9/16" thick)
    - b. FG 5100T Center glazed – 2-1/2" x 5" nominal dimension; (use for infills 1-5/16" thick)

**2.02 MATERIALS**

- A. Aluminum Members: Provide alloy and temper recommended by the manufacturer for strength, corrosion resistance, and application of required finish; comply with ASTM B 221 for extrusion and ASTM B 209 for sheet or plate.
- B. Fasteners: Provide fasteners of aluminum, nonmagnetic stainless steel, or other materials warranted by the manufacturer to be noncorrosive and compatible with aluminum components, hardware, anchors and other components.
- C. Reinforcement: Where fasteners screw-anchor into aluminum less than 0.125" thick, reinforce the interior with aluminum or nonmagnetic stainless steel to receive screw threads, or provide standard noncorrosive pressed-in splined grommet nuts.
- D. Exposed Fasteners: Except where unavoidable for application of hardware, do not use exposed fasteners. For the application of hardware, use fasteners that match the finish of member or hardware being fastened.
1. Provide Phillips flat-head machine screws for exposed fasteners.
- E. Concealed Flashing: Provide 26 gage minimum dead-soft stainless steel, or 0.026" minimum extruded aluminum of alloy and type selected by manufacturer for compatibility with other components.
- F. Brackets and Reinforcements: Where feasible, provide high-strength aluminum brackets and reinforcements; otherwise provide nonmagnetic stainless steel or hot-dip galvanized steel complying with ASTM A123.
- G. Concrete/Masonry Inserts: Provide concrete and masonry inserts fabricated from cast-iron, malleable iron, or hot-dip galvanized steel complying with ASTM A123.
- H. Glass and Glazing Materials: Comply with section 08800, "Glass and Glazing".

**2.03 COMPONENTS**

- A. Framing System: Provide inside-outside matched resilient flush-glazed storefront framing system with provisions for glass replacement. Shop-fabricate and preassemble frame components where possible.
- B. Stile-and-Rail Type Aluminum Doors:
  1. Frame: Provide tubular frame members, fabricated with mechanical joints using heavy inserted reinforcing plates and concealed tie-rods or j-bolts.
  2. Doors shall be "Wide Style" design, with 5" wide vertical styles and top rail, and 10" wide bottom rail, 2" thick, Kawneer Model #500 heavy wall doors.
    - a. Wide stile (5" nominal width); 6 1/2" bottom rail. Kawneer Model 500.
  3. Glazing: Fabricate doors to facilitate replacement of glass without disassembly of stiles and rails. Provide snap-on extruded aluminum glazing stops, with exterior stops anchored for non-removal.

**2.04 HARDWARE**

- A. General: Refer to Section 08700 for hardware requirements.

**2.05 FABRICATION**

- A. General: Sizes of door and frame units, and profile requirements, are indicated on drawings.
- B. Prefabrication: Before shipment to the project site, complete fabrication, assembly, finishing, hardware application, and other work to the greatest extent possible. Disassemble components only as necessary for shipment and installation.
1. Preglaze door and frame units to greatest extent possible.
  2. Do not drill and tap for surface-mounted hardware items until time of installation at project site.
  3. Perform fabrication operations, including cutting, fitting, forming, drilling and grinding of metal work to prevent damage to exposed finish surfaces. For hardware, perform these operations prior to application of finishes.

**Construction Specification****ALUMINUM ENTRANCES AND STOREFRONTS**

- C. Welding: Comply with AWS recommendations; grind exposed welds smooth and restore mechanical finish.
- D. Reinforcing: Install reinforcing as required for hardware and necessary for performance requirements, sag resistance and rigidity.
- E. Dissimilar Metals: Separate dissimilar metals with zinc chromate primer, bituminous paint, or other separator that will prevent corrosion.
- F. Continuity: Maintain accurate relation of planes and angles, with hairline fit of contacting members.
  - 1. Uniformity of Finish: Abutting extruded aluminum members shall not have an integral color or texture variation greater than half the range indicated in the sample pair submittal.
- G. Fasteners: Conceal fasteners wherever possible.
- H. At interior doors without weatherstripping, provide neoprene silencers on stops to prevent metal-to-metal contact.

**2.06 FINISHES**

- A. Finish:
  - 1. Main Building: Aluminum Association Class II M12C22A31 clear anodized finish with a minimum coating of 0.4 mil thickness.
  - 2. Dark bronze Class I, 0.7 mil thickness M12C22A44 Finish only if indicated on drawings.

**PART 3 - EXECUTION****3.01 INSTALLATION**

- A. Comply with manufacturer's instructions and recommendations for installation.
- B. Set units plumb, level, and true to line, without warp or rack of framing members, doors, or panels. Provide proper support and anchor securely in place.
  - 1. Separate aluminum and other corrodible metal surfaces from sources of corrosion of electrolytic action at points of contact with other materials. Comply with requirements specified under paragraph "Dissimilar Materials" in the Appendix to AAMA 101-85.
- C. Drill and tap frames and doors and apply surface-mounted hardware items. Comply with hardware manufacturer's instructions and template requirements. Use concealed fasteners wherever possible.
- D. Set sill members and other members in bed of sealant as indicated, or with joint fillers or gaskets as indicated to provide weathertight construction. Comply with requirements of Division 7 for sealants, fillers, and gaskets.
- E. Refer to "Glass and Glazing" section 08800 for installation of glass indicated to be glazed into doors and framing, and not pregazed by manufacturer.
  - 1. Type of glass for each opening is indicated on drawings.

**3.02 ADJUSTING**

- A. Adjust operating hardware to function properly, for smooth operation without binding, and for weathertight closure.

**3.03 CLEANING**

- A. Clean the completed system, inside and out, promptly after installation, exercising care to avoid damage to coatings.
- B. Clean glass surfaces after installation, complying with requirements contained in the "Glass and Glazing" section for cleaning and maintenance. Remove excess glazing and sealant compounds, dirt and other substances from aluminum surfaces.

**3.04 PROTECTION**

- A. Institute protective measures required throughout the remainder of the construction period to ensure that aluminum entrances and storefronts will be without damage or deterioration, other than normal weathering, at time of acceptance.

END OF SECTION

**Construction Specification****(FBO) AUTOMATIC SLIDING DOORS (STANLEY)****PART 1 - GENERAL****1.01 SUMMARY**

- A. This section covers the furnishing and installation of factory fabricated and finished Stanley Diamond Series Automatic Sliding Door System(s).
- B. Related Work:
  - 1. Section 01010 - Furnished by Owner Items (FBO)
  - 2. Section 08901 - Joint Sealers/Fillers
  - 3. Section 08400 - Entrances and Storefronts
  - 4. Section 08460 - Contractor Doors
  - 5. Section 08710 - Finish Hardware
  - 6. Section 08800 - Glazing
  - 7. Division 16 - Electrical

**1.02 GENERAL REQUIREMENTS**

- A. The automatic door manufacturer will maintain contact with the General Contractor to insure compliance with the installation schedule.

**1.03 FBO PROCEDURES**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section. General requirements related to Furnished by Owner (FBO) Items are as defined in Section 01010. All FBO Forms listed below are included as part of Section 01010.
- B. Vendor Contact: Contractor shall send a completed "FBO Form A: Contractor Information Form" to the FBO vendor indicated below, twelve (12) weeks prior to the scheduled installation of the specified system:

Stanley Access Technologies  
 65 Scott Swamp Road  
 Farmington, CT 06032  
 Main Contact: Shawn Thomas, National Account Project Manager  
 Office: (860) 679-6445  
 Fax: (800) 617-3168  
 E-Mail: Shawn.Thomas@sbdinc.com

or Ryan Driscoll, Team Leader – National Accounts  
 Office: (860) 679-6431  
 Cell: (860) 839-6819  
 Fax: (866) 295-4950  
 E-Mail: ryan.driscoll@sbdinc.com

- C. Take-Offs: FBO Vendor shall provide "take-offs" to the Contractor as specified in Section 01010. The Contractor shall then verify this "take-off" using an "FBO Form B: Take-Off Confirmation Sheet".
- D. Receipt of Shipment: Contractor shall verify shipment per the requirements of Section 01010 and complete the "FBO Form C: Confirmation of Shipment" and submit back to the FBO vendor.
- E. Request for Changes: Changes to materials and quantities after receipt of shipment shall be coordinated by the contractor with the FBO vendor per the requirements of Section 01010 using an "FBO Form D: Request For Additional/Replacement Materials".
- F. Return Merchandise Authorization Policy: The Home Depot will add to the contractors' scope of work the responsibility for coordinating (1) customer accommodation return request through the FBO Vendor. Requests shall be submitted using the "FBO Form E: Returned Materials" as specified in Section 01010.

**1.04 SUBMITTALS TO CONTRACTOR**

- A. Stanley Access Technologies shall submit, without delay, shop drawings required for the work to the Contractor for review. Two (2) Additional copies will be provided upon request to the General Contractor for his use in coordination of all related trade and services.
  - 1. Product Data: Provide manufacturer's product and complete installation data for all materials in this specification.
  - 2. Shop drawings: Show profiles, location of components, and dimensions as well as all necessary wiring and electrical requirements.
  - 3. Contract Closeout: Submit the Manufacturer's warranty, performance certifications [if applicable] and include manufacturer's operational manuals.

**Construction Specification****(FBO) AUTOMATIC SLIDING DOORS (STANLEY)****1.05 DELIVERY, STORAGE AND HANDLING**

- A. The automatic door installer will be responsible for off loading all automatic door materials at the job site. If delivery complications should arise or if the General Contractor is not ready for immediate installation, the General Contractor will be responsible to coordinate proper and safe off loading and storage of automatic door materials.

**PART 2 - PRODUCTS****2.01 ACCEPTABLE MANUFACTURER**

- A. Stanley Access Technologies  
(No Substitutions)

**2.02 MATERIALS - AUTOMATIC SLIDING DOOR SYSTEMS:**

- A. Automatic Sliding Door System: Shall be Stanley Diamond Series 2000/3000 or Dura-Storm Series 2000/3000 (where indicated in drawings for high wind areas). The system shall consist of sliding aluminum door(s), sidelight(s) header, operator, threshold track and actuating controls. The system shall be completely engineered, manufactured and assembled by Stanley Access Technologies.
- B. Sliding Aluminum Door Package: Provide medium stile, 3 1/2" wide and .125" thick, door units with 10" nominal height bottom rails to dimension heights and widths as shown on construction documents.
- C. Sliding Aluminum Doors: Dampers shall be provided for SO panels to control the door(s) as they swing in the direction of egress. All door panels shall have security glass stops for use with 1/4" tempered glass. Dura-Storm doors shall have security glass stops for use with 9/16" security impact glass (where required). All doors shall have a minimum of one 4 1/4" intermediate rail and a maximum of two. All bottom rails of sliding panels (SX panels) will be covered with 1/8" thick aluminum diamond kickplate on both sides. The sliding panels (SX) will have two stainless steel crash bars located on the interior of the sliding panels (SX) for 3000 Series. The sliding panels (SX) will have two stainless steel crash bars located on the exterior of the sliding panels (SX) for 2000 Series. All door corners (intersection of stiles and rails or stiles and muntin bars) will be welded secure.
- D. Hardware: The door manufacturer shall supply all hardware required for each automatic sliding door per construction drawings. The bi-part sliding door system shall include a two-point lock and armored strike to secure the lead edges of the door stiles together and to the hanger assembly. The door package shall include security hooks that latch the swing out panels in the closed position when the sliding doors are in the fully closed position. (2) Additional two-point lock and hardware shall apply to Dura-Storm doors.
- E. Door Operation: Shall be bi-part directional operation. In compliance with NFPA 101, all panel(s) shall allow "breakout" to the full open position to provide instant egress at any point in the door's movement. To allow safe egress, automatic operation shall be discontinued when any panels are in the "breakout" mode. Door(s) and sidelight(s) shall be sized to prevent pinch points at meeting stiles. An electromechanical counter shall be installed in the header to count the number of open/close cycles.
- F. Aluminum Frame and Extrusions: Shall be a minimum .125" wall thickness in integral structural sections. The frame shall be standard 4 1/2" deep section.
- G. Aluminum Extrusion Finish: Standard anodized finish shall be AA-M12-C22-A31 Clear, unless noted otherwise in drawings.
- H. Sidelights: Provide sidelights to dimension heights and widths as shown on construction documents. All sidelights shall have one to three 4 1/4" intermediate rails. The sidelights shall swing out supported by two heavy duty pivots and allow the sliding doors to "breakout" to the full open position for instant egress at any point in the door's movement per NFPA 101.
- I. Header Case: Shall be 6" wide by 8" high (152 mm wide by 203 mm high) extruded aluminum and capable of supporting bi-parting doors of 220 pounds per leaf over a span of 14'-0" with minimal deflection. It shall contain door operator and door mounting components. The header cover shall have a continuous self-locking hinge to open flush with the top of the header.
- J. Door Hanger Wheels: Shall be 2 1/2" (64 mm) diameter urethane wheels with precision steel lifetime lubricated ball bearing centers. The sliding door(s) shall be held on the track by 2" (51 mm) diameter anti-riser wheels and supported by a factory adjusted cantilever support and pivot assembly. This assembly shall allow the sliding doors to swing outward for emergency egress without the need for a lower door pivot support. The door height shall have an adjustment of 1/8" +/- as required by field conditions.
- K. Threshold Track: Shall be required under the sidelight(s) (SO panels – 3000 Series / O Panels 2000 Series).

**Construction Specification****(FBO) AUTOMATIC SLIDING DOORS (STANLEY)**

- L. Door Operator and Controller: Stanley Diamond Series shall be the Stanley Dura-Glide System driven by one (1) electro-mechanical operator and a regulated electronic controller. Dura-Storm Series shall be the Stanley Dura-Glide System driven by two (2) electro-mechanical operators and a regulated electronic controller. The operator components shall consist of a DC permanent magnet 1/4 horsepower motor, gear reduction drive, Stanley Pozi-Trac position encoder, and a microprocessor control box. Customer to provide 120 VAC, 10 amps minimum to electrical door operator.
- M. Microprocessor Control Box: Torque shall be factory set as prescribed by ANSI A156.10. The control box and Stanley Pozi-Trac position encoder shall automatically set the opening and closing check positions, and the full open and full closed position of the door system.
- N. Safety Sensors: Shall consist of two active infrared presence sensors.
- O. Doorway holding beams: Shall be factory installed at a height of 13" and 48", per ANSI code A156.10.
- P. Motion Sensor: Shall be the Stanley SU-100 Motion Sensor. The unit shall be switchable between bi-directional and uni-directional k-band frequency to detect all motion, fast or slow, in both directions with a relay hold time of 0.5 - 30 seconds. The Stanley SU-100 shall be mounted to the header 10'-0" maximum above the finish floor. Using the adjustable antenna the detection pattern shall be semi-circular, approximately 7'-0" wide by 5'-0" deep for a wide zone and approximately 6'-0" wide by 8'-0" deep for a narrow zone. The location of the detection zone shall be adjustable from the face of the door (20 degrees to 35 degrees in increments of 3 degrees). The unit shall operate between -30 degrees through 130 degrees F in all environmental conditions. The supply voltage shall be 12-24 V AC/DC +/- 10% and the power consumption shall be 6 W maximum.
- Q. Safety Search Circuitry: Shall be provided which will recycle the doors when an object is encountered during the closing cycle. The circuitry shall search for that object on the next closing cycle by reducing the door speed at the position the object was previously encountered, and will continue to close in check speed until the doors are fully closed, at which time the doors will reset to normal speed. If the obstruction is encountered again, the doors shall come to a full stop. The door shall remain stopped until the obstruction is removed and an operate signal is given, resetting the door to its normal speed.
- R. Accessories: The Diamond Series 2000/3000 automatic sliding door system shall have the following accessories to reduce energy loss: adjustable nylon sweep(s) on the bottom of the sliding door(s), double pile weather-stripping for the sliding door lead edges, single pile weather-stripping between the carrier and the header on the lead stile(s) of the sidelight(s) and the pivot stile(s) of the sliding door(s), and a rotary switch located 66" from the floor on the interior side of the unit to allow door(s) to open at full or reduced width according to weather and traffic conditions.

**2.03 OPERATING CONDITIONS:**

- A. Climatic Conditions: All automatic sliding door system components shall operate between -30 degrees F and +130 degrees F in all climatic conditions.

**PART 3 - EXECUTION****3.01 PREPERATION**

- A. The General Contractor will insure that all related construction components have been completed including completion of ALL of the door openings, concrete flooring poured, steel mounting tubes and plates set, and inspected and is available for installation prior to requesting the automatic door installation to ensure an uninterrupted installation.
- B. Installation requirements
  - 1. (11) Weeks prior to Grand Opening concrete floors need to be poured within the stated tolerance listed below.
  - 2. (10) Weeks prior to Grand Opening door openings need to be ready for job site inspection by Stanley installer.
  - 3. (9) Weeks prior to Grand Opening installation will commence. Electrical contractor needs to be roughing in conduit and wire to be completed in this week so that we may tune-in the doors for proper operation.
  - 4. Substantial completion for typical layout of Diamond doors and Double Diamond doors is (7-10) working business days
  - 5. T minus 4 weeks: The Items are installed by FBO Vendor and the Home Depot building is secure and lockable. (Substantial Completion Date) This is the minimum standard for prototypical projects. Non- standard projects may be requested sooner.

Any delay of the automatic door installation due to failure of the General Contractor to provide sufficient acceptable work areas for the automatic door installation or any damage to the automatic doors by other trades will result in a change order for additional costs incurred.

- C. The General Contractor will be responsible for the following:
  - 1. Concrete floor to be as flat as possible across ALL door openings  $\pm$  3/16".

2. Electrical contractor to coordinate with Stanley installer on placement of conduit and junction boxes for the 110V feeds.

### 3.02 INSTALLATION OF AUTOMATIC SLIDING ENTRANCE SYSTEMS

- A. All Installation shall be by Stanley Access Technologies and its authorized installers. For details and information related to this installation of the specified products and materials please refer Part 2- Product (2.01) of this specification.
- B. Comply with the automatic sliding door system manufacturer's recommendations and/or installation guide when installing the automatic sliding door system. Set all units plumb, level and true.
- C. Provide all fasteners required for installation of the automatic sliding door system.
- D. Adjustment and Cleaning: After repeated operation of the completed installation, re-adjust door operators and controls for optimum operating condition and safety. Clean all metal surfaces promptly after installation.
- E. Explain and review the Daily Safety Check Procedure.

### 3.03 INSPECTION

- A. Verify that the automatic sliding door system installation will not disrupt other trades. The door installer shall verify that the installation area is dry, clean and free of foreign matter. Check as-built conditions and verify the manufacturer's automatic sliding entrance system details for accuracy to fit the wall assembly prior to fabrication. Report in writing to the Contractor any detrimental conditions to the proper functioning of the automatic sliding door system. Installation shall proceed once the unsatisfactory conditions have been corrected in accordance to the manufacturer's recommendations.

END OF SECTION

**Construction Specification****(FBO) CONTRACTOR DOORS (STANLEY)****PART 1 - GENERAL****1.01 SUMMARY**

- A. This section covers the furnishing and installation of a complete Stanley Double Diamond Series electrically operated heavy-duty sliding door and equipment.
- B. Related Work:
  - 1. Section 01010 - Furnished by Owner Items (FBO)
  - 2. Section 08901 - Joint Sealers/Fillers
  - 3. Section 08400 - Entrances and Storefronts
  - 4. Section 08425 - Automatic Sliding Doors
  - 5. Section 08710 - Finish Hardware
  - 6. Section 08800 - Glazing
  - 7. Division 16 - Electrical

**1.02 GENERAL REQUIREMENTS**

- A. The automatic door manufacturer will maintain contact with the General Contractor to insure compliance with the installation schedule.

**1.03 FBO PROCEDURES**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section. General requirements related to Furnished by Owner (FBO) Items are as defined in Section 01010. All FBO Forms listed below are included as part of Section 01010.
- B. Vendor Contact: Contractor shall send a completed "FBO Form A: Contractor Information Form" to the FBO vendor indicated below, twelve (12) weeks prior to the scheduled installation of the specified system:

Stanley Access Technologies  
 65 Scott Swamp Road  
 Farmington, CT 06032  
 Main Contact: Shawn Thomas, National Account Project Manager  
 Office: (860) 679-6445  
 Fax: (800) 617-3168  
 E-Mail: Shawn.Thomas@sbdinc.com

or Ryan Driscoll, Team Leader – National Accounts  
 Office: (860) 679-6431  
 Cell: (860) 839-6819  
 Fax: (866) 295-4950  
 E-Mail: ryan.driscoll@sbdinc.com

- C. Take-Offs: FBO Vendor shall provide "take-offs" to the Contractor as specified in Section 01010. The Contractor shall then verify this "take-off" using an "FBO Form B: Take-Off Confirmation Sheet".
- D. Receipt of Shipment: Contractor shall verify shipment per the requirements of Section 01010 and complete the "FBO Form C: Confirmation of Shipment" and submit back to the FBO vendor.
- E. Request for Changes: Changes to materials and quantities after receipt of shipment shall be coordinated by the contractor with the FBO vendor per the requirements of Section 01010 using an "FBO Form D: Request For Additional/Replacement Materials".
- F. Return Merchandise Authorization Policy: The Home Depot will add to the contractors' scope of work the responsibility for coordinating (1) customer accommodation return request through the FBO Vendor. Requests shall be submitted using the "FBO Form E: Returned Materials" as specified in Section 01010.

**1.04 SUBMITTALS TO CONTRACTOR**

- A. Stanley Access Technologies shall submit, without delay, shop drawings required for the work to the Contractor for review. Two (2) Additional copies will be provided upon request to the General Contractor for his use in coordination of all related trade and services.
  - 1. Product Data: Provide manufacturer's product and complete installation data for all materials in this specification.
  - 2. Shop drawings: Show profiles, location of components, and dimensions as well as all necessary wiring and electrical requirements.
  - 3. Contract Closeout: Submit the Manufacturer's warranty, performance certifications [if applicable] and include manufacturers operational manuals.



**Construction Specification****(FBO) CONTRACTOR DOORS (STANLEY)****1.05 DELIVERY, STORAGE AND HANDLING**

- A. The automatic door installer will be responsible for off loading all automatic door materials at the job site. If delivery complications should arise or if the General Contractor is not ready for immediate installation, the General Contractor will be responsible to coordinate proper and safe off loading and storage of automatic door materials.

**PART 2 - PRODUCTS****2.01 ACCEPTABLE MANUFACTURER**

- A. Stanley Access Technologies  
(No Substitutions)

**2.02 MATERIALS**

- A. Aluminum Members: Alloy and temper recommended by the manufacturer for strength, corrosion resistance and application of required finish. Comply with ASTM B209 for aluminum sheet or plate; and ASTM B211 for aluminum bars, rods and wire.
  - 1. Provide extrusions of not less than .0125 inch wall thickness.
  - 2. Finish shall be: AA.M12.C22A31 Clear.
- B. Fasteners: Provide aluminum, stainless steel, or other none corrosive metal fasteners compatible with aluminum components, hardware, anchors and other items being fastened.
- C. Sliding Weather Stripping: Provide double pile weather stripping brushes installed at the trailing edges of the slow moving panel and between the header and the all door panels.
- D. Glass and Glazing: Comply with the requirements of Section 08800 – Glazing. Panels shall have security glass stops.

**2.03 AUTOMATIC ENTRANCE DOORS**

- A. Manufactured door units: Shall include operator, header, sliding door panels.
- B. Operator: The electric operating mechanism shall be contained in the header. Operating force shall be accomplished through two (2) 1/4 horsepower heavy-duty motors. Provide 120VAC, 10 amps minimum to electrical door operator.
  - 1. Operators shall include a selector switch that will allow the doors to open to full or reduced opening width according to weather or traffic conditions.
  - 2. Doors shall accommodate pedestrian as well as tow motor type traffic.
  - 3. Operators shall be fully adjustable for opening and closing speeds, check speed, and hold open time. Operator shall include a mechanical counter capable of recording each cycle of door operation.
  - 4. Provide one point locking system securing leading edges of doors together.
- C. Header: Shall be aluminum 11.75" high, 6" deep capable of spanning required door width with minimal deflection. Faceplate cover shall be removable for servicing of components.
- D. Track and Guide System: No bottom track allowed. Provide 2.5" diameter urethane wheels with precision steel lifetime lubricated ball bearing centers. A floor-mounted guide shall be provided for slow moving panel alignment.
- E. Sliding Panels: Panels shall be aluminum .0125 wall thickness with threaded tie rod and welded construction. Panels shall have two (2) intermediate rails located at 61" and 89" from door bottom. Bottom door rails shall be 10" nominal height. Stiles shall be medium.
- F. Clear Door Opening: The system shall provide a 20' W. x 12' H. clear opening dimension.
- G. Activation
  - 1. Safety Sensors: Shall consist of four active infrared presence sensors, and two doorway holding beams.
  - 2. Motion Sensors: Shall consist of eight Stanley SU-100 motion sensors. Each unit shall be switchable between bi-directional and uni-directional k-band frequency to detect all motion, fast or slow, in both directions with a relay hold time of 0.5 to 30 seconds. The Stanley SU-100 shall be mounted to the header 13' maximum above the finish floor. Using the factory-equipped wide-pattern antenna and optional narrow-pattern antenna stored in the sensor housing, the unit can be adjusted for a variety of detection patterns. The detection patterns shall vary based on the sensor mounting height and adjustments made to the sensor sensitivity, vertical direction, and lateral direction settings. The unit shall operate between -30 degrees through +130 degrees F in all environmental conditions. The supply voltage shall be 12 to 24 VAC +/-10% or 12 to 30 VDC +30%/-10%, and the power consumption shall be less than 2.
  - 3. Forklift detector: Shall consist of a BEA Falcon sensor (2) per side.

**Construction Specification****(FBO) CONTRACTOR DOORS (STANLEY)**

- 4. Hand held remote: **\*\*(Optional)\*\*** - One two-button remote can be provided with each system. The remote can be programmed in one of the following two ways
  - a. One button to open the doors to full open and the other button to open the doors to partial open.
  - b. One button to open the front door to full open and the other button to open the back door to full open
- 5. Push Button: (1) Hard Wired (2) Station Push Button Control at Register.
- H. Externally mounted keypad: to be programmed to customer specified code. Shall always open the door fully.
- I. Partial and Full Opening Capability: The system shall provide both partial opening and full opening operation. If a pedestrian approaches the door the system shall open to approximately 5'-0" of clear opening. If a fork lift signal is received the door will open to its full 20' clear opening.
- J. Operation Selection Switch (Front Door): The operation selection switch shall be a 4 position rotary switch that provides the following operations: Hold Open, Hold Closed, Automatic (Open, Close), and Automatic (Exit Only). A name plate shall be provided indicating each operational position.

**PART 3 - EXECUTION****3.01 PREPERATION**

- A. The General Contractor will insure that all related construction components have been completed including completion of ALL of the door openings, concrete flooring poured, steel mounting tubes and plates set, and inspected and is available for installation prior to requesting the automatic door installation to ensure an uninterrupted installation.
- B. Installation requirements
  - 1. (11) Weeks prior to Grand Opening concrete floors need to be poured within the stated tolerance listed below.
  - 2. (10) Weeks prior to Grand Opening door openings need to be ready for job site inspection by Stanley installer.
  - 3. (9) Weeks prior to Grand Opening installation will commence. Electrical contractor needs to be roughing in conduit and wire to be completed in this week so that we may tune-in the doors for proper operation.
  - 4. Substantial completion for typical layout of Diamond doors and Double Diamond doors is (7-10) working business days
  - 5. T minus 4 weeks: The Items are installed by FBO Vendor and the Home Depot building is secure and lockable. (Substantial Completion Date) This is the minimum standard for prototypical projects. Non-standard projects may be requested sooner.

Any delay of the automatic door installation due to failure of the General Contractor to provide sufficient acceptable work areas for the automatic door installation or any damage to the automatic doors by other trades will result in a change order for additional costs incurred.

- C. The General Contractor will be responsible for the following:
  - 1. Concrete floor to be as flat as possible across ALL door openings  $\pm 3/16"$ . This is especially critical at the Double Diamond Doors which needs to be flat across the entire 33'6" span of concrete.
  - 2. Proper steel tube must be set flush with the interior surface of the wall for the Front Double Diamond door.
  - 3. 12"x12"x1/4" thick (minimum) steel plates must be imbedded in the concrete tilt up walls on the side that the door header mounts at 24" centers – (3) required per each side of the header - at the Double Diamond doors for proper mounting of the headers.
  - 4. Electrical contractor to coordinate with Stanley installer on placement of conduit and junction boxes for the 110V feeds and the control wire for the rotary switches and battery back-up controls.

**3.02 INSTALLATION OF AUTOMATIC SLIDING DOOR SYSTEMS**

- A. All Installation shall be by Stanley Access Technologies and its authorized installers. For details and information related to this installation of the specified products and materials please refer Part 2- Product (2.01) of this specification.
- B. Comply with the automatic sliding door system manufacturer's recommendations and installation guide when installing the automatic sliding entrance system. Set all units plumb, true and level.
- C. Provide all fasteners required for installation of the automatic sliding door system.
- D. Glazing: The doors must be glazed with 1/4" Acrylite AR with SAR scratch resistant coating and/or 1/4" clear tempered glass.
- E. Adjustment and Cleaning: After repeated operation of the completed installation, readjust door operators and controls for optimum operating condition and safety. Clean all metal surfaces promptly after installation
- F. Explain and review the daily safety check procedure.

**3.03 INSPECTION**

**Construction Specification**

**(FBO) CONTRACTOR DOORS (STANLEY)**

- A. Verify that the automatic sliding door system installation will not disrupt other trades. The door installer shall verify that the installation area is dry, clean and free of foreign matter. Check as-built conditions and verify the manufacturer's automatic sliding entrance system details for accuracy to fit the wall assembly prior to fabrication. Report in writing to the Contractor any detrimental conditions to the proper functioning of the automatic sliding entrance system. Installation shall proceed once the unsatisfactory conditions have been corrected in accordance to the manufacturer's recommendations.

END OF SECTION

**PART 1 - GENERAL****1.01 SUMMARY**

- A. Extent of skylights required as indicated on Drawings.
- B. This sections includes the following:
  - 1. Fixed Skylights.
- C. Related work specified elsewhere includes but may not be limited to:

- 1. Section 07534 - Single Ply TPO Membrane Roofing

**1.02 REFERENCES**

- A. Unless otherwise shown or specified, this work shall conform to the following standards:
  - 1. Aluminum Association (AA):
    - a. Specifications for Aluminum Structures.
  - 2. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE).
    - a. ASHRAE 90.1 - Energy Standard for Buildings except Low-Rise Residential Buildings.
  - 3. ASTM International (ASTM):
    - a. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
  - 4. Factory Mutual System (FM Global):
    - a. FM - Approval Guide, Chapter 18 - Building Materials.
    - b. FM Standard 4430 - Test Criteria for Heat and Smoke Vents.
  - 5. National Fenestration Rating Council (NFRC):
    - a. NFRC 100 - Procedure for Determining Fenestration Product U-Factors.
    - b. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance of Normal Incidence.
  - 6. North American Fenestration Standard (NAFS):
    - a. AAMAWDMACSA1011.S.2A440 - The Voluntary Performance Specification for Windows, Skylights, and Glass Doors.

**1.03 PERFORMANCE REQUIREMENTS**

- A. Skylights must conform with all federal, state and local code bodies having jurisdiction, and be designed to withstand all forces of nature deemed necessary by those code bodies for the specified project location.
- B. Plastic unit skylights shall conform to recommendations of the AA Specifications for Aluminum Structures.
- C. Skylights must be designed to carry a minimum 30 psf tributary roof load or greater per site as specified in the current International Building Code or prevailing model code.
- D. Skylights must be tested and labeled in accordance to AAMAWDMACSA1011.S.2A440 as required by Section 2405.5 of the 2003 International Building Code.
- E. Drop Test:
  - 1. A 200 lb drop test from a height of 24 inches above the center (highest point) of dome shape and at mid points of both the 5 foot and 6 foot side (approximately 15 inches and 18 inches from center).
  - 2. The 200 lb load must be contained within a flexible bladder or sack having approximate dimensions no larger than 30 inches long, 20 inches wide, and 8 inches high, filled with course sand or pea gravel.
  - 3. The dome must withstand the sack drop without inverting or breaking.
  - 4. Finished skylight domes sealed in frame must also handle 500 lb on 1 square foot point loading without inverting.
  - 5. The drop test must be witnessed and certified by the test laboratory which provides the NAFS certification.
- F. Skylights must be certified by the NFRC and NAFS.
- G. Skylights must be Factory Mutual approved.

**H. HVHZ Compliance (for Florida projects only):**

1. Projects which fall under the jurisdiction of the Florida Building Code must have a current Florida Building Code (FBC) Number to meet the High Velocity Hurricane Zone (HVHZ) requirements and are required for acceptance of Work specified in this section.
2. Projects which fall under the jurisdiction of Miami / Dade County must have a current Dade County Product Control Notice of Acceptance (NOA) to meet the High Velocity Hurricane Zone (HVHZ) requirements and are required for acceptance of Work specified in this section.
3. Skylight systems must comply with the jurisdictional code body's submittal data and supporting drawings and documentation. Where the code body's acceptance criteria differs from these specifications regarding components and hardware, the code body's requirements shall govern.

**1.04 SUBMITTALS TO CONTRACTOR**

- A. Product Data: Manufacturer's data sheets on each product to be used, including:
  1. Preparation instructions and recommendations.
  2. Storage and handling requirements and recommendations.
  3. Installation methods.
- B. Shop Drawings: Submit plan, section, elevation, and perspective drawings as necessary to depict each specified skylight. Include all flashing, connection, and termination details necessary for a proper and complete installation.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: All primary products specified in this section will be supplied by a single manufacturer with a minimum of ten (10) years experience.
- B. Installer Qualifications: All products listed in this section are to be installed by a single installer with a minimum of five (5) years demonstrated experience in installing products of the same type and scope as specified.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of hazardous materials, and materials contaminated by hazardous materials, in accordance with requirements of local authorities having jurisdiction.

**1.07 PROJECT CONDITIONS**

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

**1.08 WARRANTY**

- A. Provide written five (5) year warranty signed by manufacturer, agreeing to repair or replace work which exhibits defects in materials, workmanship and leakage from the date of the Grand Opening.

**PART 2 - PRODUCTS****2.01 MANUFACTURERS**

- A. Acceptable Manufacturer:
  1. Sunoptics Prismatic Skylights: 6201 27th St., Sacramento, CA 95822;  
Toll Free Tel: 800-289-4700; e-mail: [SunopticsInsideSales@AcuityBrands.com](mailto:SunopticsInsideSales@AcuityBrands.com)
- B. Substitutions: Not permitted

**2.02 FIXED SKYLIGHTS**

- A. Model: Unit to be model 800MD-5070 with an inside curb dimension of 63 1/4" x 87 1/4"

**B. Glazing Panels - Double Glazed:**

1. Configuration: Signature Series Dome.
    - a. Outer Lens: SR 40 - 100% impact modified clear prismatic acrylic of sufficient thickness recommended to meet the specified performance requirements.
    - b. Inner lens: SR25 White Prismatic Acrylic Lens.
  2. Energy Requirements: Glazing material must have a maximum light distribution characteristic that maximizes the shading factor. Per Addendum D of ASHRAE 90.1 - 2007, the diffusing qualities of glazing must have a minimum haze factor of 90% or greater. The combined inner/outer lens target values shall be as follows:
    - a. Light Transmittance: 67.8% minimum. CLASS 1 & CLASS 3 ACRYLIC
    - b. Light Transmittance: 60.0% minimum. Clear Armor Polycarbonate
    - c. Diffusion / Haze Factor: 100% min.
    - d. Solar Heat Gain Coefficient (SHGC): 0.49 maximum. NFRC 200
    - e. "U" Value: 0.82 or lower (glazing and framing) in accordance with NFRC 100 or "unlabeled skylight" default requirements of ASHRAE 90.1 - **2004**.
  3. Hail Resistance Level: Class 3 as tested by certified engineering firm.
  4. High Wind / High Impact: Clear Armor Polycarbonate as tested by certified engineering firm.
- C. Frame:
1. ASTM B 221 alloy 6063-T5 extruded aluminum frame with extruded aluminum dome retaining angle. Insulated thermal break, and integral condensate gutter.
  2. Finish: Manufacturer's standard mill finish.
  3. Provide pre-installed 1 1/2 inch x 1/4 inch foam rubber gasket between frame and curb.
  4. Provide weather sweep attached to frame.

**D. Curb:**

1. 14 gauge structural steel curbs provided by the skylight manufacturer.
2. Curb Dimensions: Curb height shall be as indicated in construction drawings. Recommend a 1/2 inch surround around finished and final flashed curb. Curb base shall be sized to span structural steel roof framing.
3. Insulation: 3/4" thick Polyisocyanurate Fed. Spec HH-1-1972/2 Class 2 fully adhered to metal curb.
4. Nailer: 2x4 treated wood

**2.03 ACCESSORIES**

- A. Fasteners (For anchorage of skylight to roof curb): #12 x 1 1/2 inch 300 series stainless steel screws with washers. Provide fasteners in sufficient quantity for complete installation.
- B. Washers: Neoprene/stainless steel bonded washers.
- C. Safety-Security Guard: fabricated from a 4 inch x 4 inch wire mesh galvanized cold rolled steel. Weld guard to structural steel curb.

**2.04 FABRICATION**

- A. Skylights must be factory assembled and glazed ready for installation.
- B. Fabricate skylights weather tight and free of visual distortions and defects.
- C. Protect exterior drip / counter flashing and drainage ports from weather and air-borne debris.
- D. Miter and full penetration weld all corners of curb and retaining frames.
- E. Retaining frames that secure the glazing panels along each side under spring tension need not be welded and must be sealed with a silicone sealant along the full perimeter of the retaining frame. Skylight frames must be pre-drilled for anchorage to roof curbs.
- F. Seal glazing panels to base frame allowing for sufficient expansion and contraction. Provide exterior weep hole arrangement.

**PART 3 - EXECUTION****3.01 EXAMINATION**

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

**3.02 PREPARATION**

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

**3.03 INSTALLATION**

- A. Install curbs in accordance with manufacturer's instructions and as indicated on Drawings. Coordinate installation with roof membrane installation requirements specified under other Sections.
  - 1. Connection to Roof Framing
    - a. Set units in place and secure base to roof structure by welding to top chord of structural member.
    - b. Secure metal deck to perimeter of curb as indicated on Drawings.
  - B. Install skylight units in accordance with manufacturer's instructions.
  - C. Isolate between aluminum and dissimilar metals with a protective coating or plastic strip to prevent electrolytic corrosion.

**3.04 PROTECTION**

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

**3.05 CLEAN UP**

- A. During the progress of the work, the premises shall be kept free of debris and waste.
- B. At completion of work, touch up minor damage. Replace materials damaged or stained.

**END OF SECTION**

**PART 1 - GENERAL****1.01 SUMMARY**

- A. Extent of heat and smoke venting skylights required as indicated on Drawings.
- B. This sections includes the following:
  - 1. Heat and Smoke Venting Skylights.
- C. Related work specified elsewhere includes but may not be limited to:

- 1. Section 07534 - Single Ply TPO Membrane Roofing

**1.02 REFERENCES**

- A. Unless otherwise shown or specified, this work shall conform to the following standards:
  - 1. Aluminum Association (AA):
    - a. Specifications for Aluminum Structures.
  - 2. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE).
    - a. ASHRAE 90.1 - Energy Standard for Buildings except Low-Rise Residential Buildings.
  - 3. ASTM International (ASTM):
    - a. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
  - 4. Factory Mutual System (FM Global):
    - a. FM - Approval Guide, Chapter 18 - Building Materials.
    - b. FM Standard 4430 - Test Criteria for Heat and Smoke Vents.
  - 5. National Fenestration Rating Council (NFRC):
    - a. NFRC 100 - Procedure for Determining Fenestration Product U-Factors.
    - b. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance of Normal Incidence.
  - 6. North American Fenestration Standard (NAFS):
    - a. AAMAWDMACSA1011.S.2A440 - The Voluntary Performance Specification for Windows, Skylights, and Glass Doors.

**1.03 PERFORMANCE REQUIREMENTS**

- A. Skylights must conform with all federal, state and local code bodies having jurisdiction, and be designed to withstand all forces of nature deemed necessary by those code bodies for the specified project location.
- B. Plastic unit skylights shall conform to recommendations of the AA Specifications for Aluminum Structures.
- C. Skylights must be designed to carry a minimum 30 psf tributary roof load or greater per site as specified in the current International Building Code or prevailing model code.
- D. Skylights must be tested and labeled in accordance to AAMAWDMACSA1011.S.2A440 as required by Section 2405.5 of the 2003 International Building Code.
- E. Drop Test:
  - 1. A 200 lb drop test from a height of 24 inches above the center (highest point) of dome shape and at mid points of both the 5 foot and 6 foot side (approximately 15 inches and 18 inches from center).
  - 2. The 200 lb load must be contained within a flexible bladder or sack having approximate dimensions no larger than 30 inches long, 20 inches wide, and 8 inches high, filled with course sand or pea gravel.
  - 3. The dome must withstand the sack drop without inverting or breaking.
  - 4. Finished skylight domes sealed in frame must also handle 500 lb on 1 square foot point loading without inverting.
  - 5. The drop test must be witnessed and certified by the test laboratory which provides the NAFS certification.
- F. Skylights must be certified by the NFRC and NAFS.
- G. Skylights must be Factory Mutual approved.



**H. HVHZ Compliance (for Florida projects only):**

1. Projects which fall under the jurisdiction of the Florida Building Code must have a current Florida Building Code (FBC) Number to meet the High Velocity Hurricane Zone (HVHZ) requirements and are required for acceptance of Work specified in this section.
2. Projects which fall under the jurisdiction of Miami / Dade County must have a current Dade County Product Control Notice of Acceptance (NOA) to meet the High Velocity Hurricane Zone (HVHZ) requirements and are required for acceptance of Work specified in this section.
3. Skylight systems must comply with the jurisdictional code body's submittal data and supporting drawings and documentation. Where the code body's acceptance criteria differs from these specifications regarding components and hardware, the code body's requirements shall govern.

**1.04 SUBMITTALS TO CONTRACTOR**

- A. Product Data: Manufacturer's data sheets on each product to be used, including:
  1. Preparation instructions and recommendations.
  2. Storage and handling requirements and recommendations.
  3. Installation methods.
- B. Shop Drawings: Submit plan, section, elevation, and perspective drawings as necessary to depict each specified skylight. Include all flashing, connection, and termination details necessary for a proper and complete installation.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: All primary products specified in this section will be supplied by a single manufacturer with a minimum of ten (10) years experience.
- B. Installer Qualifications: All products listed in this section are to be installed by a single installer with a minimum of five (5) years demonstrated experience in installing products of the same type and scope as specified.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of hazardous materials, and materials contaminated by hazardous materials, in accordance with requirements of local authorities having jurisdiction.

**1.07 PROJECT CONDITIONS**

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

**1.08 WARRANTY**

- A. Provide written five (5) year warranty signed by manufacturer, agreeing to repair or replace work which exhibits defects in materials, workmanship and leakage from the date of the Grand Opening.

**PART 2 - PRODUCTS****2.01 MANUFACTURERS**

- A. Acceptable Manufacturer:
  1. Sunoptics Prismatic Skylights: 6201 27th St.; Sacramento, CA 95822;  
Toll Free Tel: 800-289-4700; e-mail: [SunopticsInsideSales@AcuityBrands.com](mailto:SunopticsInsideSales@AcuityBrands.com)
- B. Substitutions: Not permitted.

**2.02 HEAT AND SMOKE VENTING SKYLIGHTS**

- A. Model: Unit to be model 870FM-5070 with an inside curb dimension of 63 1/4" x 87 1/4".

**Construction Specification****HEAT AND SMOKE VENTS****B. Glazing Panels:**

1. Configuration: Signature Series Dome - Double Glazed.
  - a. Outer Lens: SR 40 - 100% impact modified clear prismatic acrylic of sufficient thickness recommended to meet the specified performance requirements.
  - b. Inner lens: SR25 White Prismatic Acrylic Lens.
2. Energy Requirements: Glazing material must have a maximum light distribution characteristic that maximizes the shading factor. Per Addendum D of ASHRAE 90.1 - 2007, the diffusing qualities of glazing must have a minimum haze factor of 90% or greater. The combined inner/outer lens target values shall be as follows:
  - a. Light Transmittance: 67.8% minimum - 100% Class 1 and Class 3 Acrylic outer dome.
  - b. Light Transmittance: 60.0% minimum - Clear ArmorSYMBOL 212 Polycarbonate outer dome.
  - c. Diffusion / Haze Factor: 100% min.
  - d. Solar Heat Gain Coefficient (SHGC): 0.52 maximum. NFRC 200
  - e. "U" Value: 0.82 or lower (glazing and framing) in accordance with NFRC 100 or "unlabeled skylight" default requirements of ASHRAE 90.1 - 2004

3. Hail Resistance Level: Class 3 as tested by certified engineering firm.
4. High Wind / High Impact: Clear ArmorSYMBOL 212 Polycarbonate as tested by certified engineering firm.

**C. Frame:**

1. ASTM B 221 alloy 6063-T5 extruded aluminum frame with extruded aluminum dome retaining angle. Insulated thermal break, and integral condensate gutter.
2. Finish: Manufacturer's standard mill finish.
3. Provide pre-installed 1 1/2 inch x 1/4 inch foam rubber gasket between frame and curb.
4. Provide weather sweep attached to frame.

**D. Curb:**

1. 14 gauge structural steel curbs provided by the skylight manufacturer.
2. Curb Dimensions: Curb height shall be as indicated in construction drawings. Recommend a 1/2 inch surround around finished and final flashed curb. Curb base shall be sized to span structural steel roof framing.
3. Insulation: 3/4" thick Polysocyanurate Fed. Spec HH-1-1972/2 Class 2 fully adhered to metal curb.
4. Nailers: 2x4 treated wood

**E. Venting Criteria (UL/FM Smoke Vent):**

1. Description: FM Approved Double-leaf, double glazed, venting skylight with plastic thermal break, sealed and insulated, with fusible link.
2. Venting skylights shall meet all requirements specified above for fixed skylight units.
3. Fusible link rating: Refer to drawings.
4. Doors: Acrylic plastic double dome designed to remain tightly sealed against 30 lbs /sq. ft internal uplift pressure until triggered by UL listed fusible link or opened manually from interior level. When released, doors shall be capable of opening against a 10, 25 or 30 lbs./sq. ft external snow or wind load as indicated in construction drawings and lock in open position.

**2.03 ACCESSORIES**

- A. Fasteners (For anchorage of skylight to roof curb): #12 x 1 1/2 inch 300 series stainless steel screws with washers. Provide fasteners in sufficient quantity for complete installation.
- B. Washers: Neoprene/stainless steel bonded washers.
- C. Safety-Security Guard: fabricated from a 4 inch x 4 inch wire mesh galvanized cold rolled steel. Weld guard to structural steel curb.

**2.04 FABRICATION**

- A. Skylights must be factory assembled and glazed ready for installation.
- B. Fabricate skylights weather tight and free of visual distortions and defects.
- C. Protect exterior drip / counter flashing and drainage ports from weather and air-borne debris.

**Construction Specification****HEAT AND SMOKE VENTS**

- D. Miter and full penetration weld all corners of curb and retaining frames.
- E. Retaining frames that secure the glazing panels along each side under spring tension need not be welded and must be sealed with a silicone sealant along the full perimeter of the retaining frame. Skylight frames must be pre-drilled for anchorage to roof curbs.
- F. Seal glazing panels to base frame allowing for sufficient expansion and contraction. Provide exterior weep hole arrangement.

**PART 3 - EXECUTION****3.01 EXAMINATION**

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

**3.02 PREPARATION**

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

**3.03 INSTALLATION**

- A. Install curbs in accordance with manufacturer's instructions and as indicated on Drawings. Coordinate installation with roof membrane installation requirements specified under other Sections.
  - 1. Connection to Roof Framing
    - a. Set units in place and secure base to roof structure by welding to top chord of structural member.
    - b. Secure metal deck to perimeter of curb as indicated on Drawings.
  - B. Install skylight units in accordance with manufacturer's instructions.
  - C. Isolate between aluminum and dissimilar metals with a protective coating or plastic strip to prevent electrolytic corrosion.
  - D. Remove any shipping clips that would prevent operation of unit once installation is complete.

**3.04 PROTECTION**

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

**3.05 CLEAN UP**

- A. During the progress of the work, the premises shall be kept free of debris and waste.
- B. At completion of work, touch up minor damage. Replace materials damaged or stained.

**END OF SECTION**

**Construction Specification****(FBO) FINISH HARDWARE (DH PACE)****PART 1 - GENERAL****1.01 SUMMARY**

- A. Extent and types of finish hardware is indicated on drawings and schedules.
- B. Related work specified elsewhere
  - 1. Section 01010 - Furnished By Owner Items (FBO)

**1.02 REFERENCES**

- A. Standards
  - 1. NFPA-80 - Fire Doors and Windows.
  - 2. ANSI/BHMA A156.18 - Materials and Finishes
- B. Codes
  - 1. ANSI/NFPA 101 - Life Safety Code

**1.03 FBO PROCEDURES**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section. General requirements related to Furnished by Owner (FBO) Items are as defined in Section 01010. All FBO Forms listed below are included as part of Section 01010.
- B. Vendor Contact: Contractor shall send a completed "FBO Form A: Contractor Information Form" to the FBO vendor indicated below, twelve (12) weeks prior to the scheduled installation of the specified system:
 

D.H. Pace Door Services (D.H. Pace Company, Inc.)  
 218 East 11th Avenue  
 North Kansas City, MO 64116  
 Contact: Brad Thomas  
 Phone: (888) 643-3667 or (816) 480-2600; Fax: (816) 480-2658  
 E-mail: [brad.thomas@dhpace.com](mailto:brad.thomas@dhpace.com) or [homedepot@dhpace.com](mailto:homedepot@dhpace.com)
- C. Take-Offs: FBO Vendor shall provide "take-offs" to the Contractor as specified in Section 01010. The Contractor shall then verify this "take-off" using an "FBO Form B: Take-Off Confirmation Sheet".
- D. Receipt of Shipment: Contractor shall verify shipment per the requirements of Section 01010 and complete the "FBO Form C: Confirmation of Shipment" and submit back to the FBO vendor.
- E. Request for Changes: Changes to materials and quantities after receipt of shipment shall be coordinated by the contractor with the FBO vendor per the requirements of Section 01010 using an "FBO Form D: Request For Additional/Replacement Materials".
- F. Return Merchandise Authorization Policy: The Home Depot will add to the contractors' scope of work the responsibility for coordinating (1) customer accommodation return request through the FBO Vendor. Requests shall be submitted using the "FBO Form E: Returned Materials" as specified in Section 01010.

**1.04 SUBMITTALS TO GENERAL CONTRACTOR**

- A. A copy of the "bid set" construction documents will be forwarded to FBO supplier from Architect of Record. FBO supplier will complete initial "take-off" indicating all materials to be shipped. FBO supplier will confirm the order with The Home Depot representative within 20 days of the receipt of construction documents.
  - 1. General Contractor will receive complete "submittal package" indicating all materials to be shipped. General Contractor is then responsible for confirming the submitted materials and quantities with the plans and specifications. A return confirmation must be sent back to FBO supplier for final coordination of package contents.
  - 2. FBO supplier is solely responsible for correctness of shipped materials and quantities.

**1.05 QUALITY ASSURANCE**

- A. The person responsible for scheduling, detailing, ordering and coordinating hardware for this project shall be an experienced hardware consultant. Consultant membership in the Door and Hardware Institute is acceptable as indication of required experience.
- B. Hardware furnished shall comply with the requirements of the Standards and Codes listed in 1.04 of this Section.
- C. For fire-rated openings provide hardware tested and listed by UL or FM (NFPA Standard 80). On panic exit devices, provide UL or FM label indicating "Fire Exit Hardware".

**Construction Specification****(FBO) FINISH HARDWARE (DH PACE)**

- D. Hurricane Resistant Door Assemblies: Where hurricane resistant door assemblies are indicated, refer to drawings for testing approval(s) required.

**1.06 DELIVERY, STORAGE AND HANDLING**

- A. Hardware shall be delivered to the job site in the manufacturer's original packages. Each item shall be clearly marked with opening number and hardware heading by correct location.
- B. General Contractor to provide locked storage space complete with shelving, for unpacking of and sorting out hardware. The space shall be maintained clean and dry for protection of hardware.

**1.07 SEQUENCING AND SCHEDULING**

- A. Coordinate hardware with related trades such as entrance, steel, wood doors, frames, millwork electrical, etc.
- B. After award of contract, General Contractor is to provide schedule for delivery utilizing FBO supplier's Field Release Form.

**1.08 WARRANTY**

- A. All hardware items shall be guaranteed for a period of one (1) year from the Grand Opening, with exception of door closers, which shall have a ten (10) year warranty.

**PART 2 - PRODUCTS****2.01 ACCEPTABLE MANUFACTURERS**

- A. A Specified Manufacturer is shown for each Hardware item to establish a standard of quality and minimum functional requirements. The product numbers of these manufacturers are found on the drawings within the Hardware Sets.
- B. No substitutions.
- C. All items of a particular hardware category (i.e. locksets, closers, hinges) shall be of the same manufacturer.
- D. Hinges
  - 1. Specified Manufacturer: Stanley
- E. Locksets, Latches, Cylinders
  - 1. Specified Manufacturer: Best Access Systems
- F. Door closers
  - 1. Specified Manufacturer: LCN
- G. Pushes, pulls, stops, trim, door viewer
  - 1. Specified Manufacturer: Hager or Rockwood Mfg
- H. Weatherstrip, thresholds, door bottom sweeps, drip caps
  - 1. Specified Manufacturer: National Guard Products (NGP)
- I. Exit control devices and exit alarms
  - 1. Specified Manufacturer: Detex
- J. Mag. Locks, Key Switch, and Push Switch
  - 1. Specified Manufacturer: Locknetics by Schlage or RCI.
- K. Electric Strikes
  - 1. Specified Manufacturer: Folger Adam Co.

**2.02 KEYING**

- A. All locks and cylinders shall be keyed to a new Best Master Key System. Provide all locks by Best Access Systems with 7 pin removable construction cores.
- B. Final interchangeable cores shall be supplied by Owner.
- C. All locksets and cylinders shall be subject to a Construction Masterkey System during the construction period. Construction Masterkey System shall be voided at the project completion at the direction of the owner.
- D. Key requirements as follows:
  - 1. 6 Construction Master keys

**Construction Specification**

**(FBO) FINISH HARDWARE (DH PACE)**

2. All permanent keys and cores by Owner.

**2.03 MATERIAL AND FINISHES**

- A. Refer to drawings.

**PART 3 - EXECUTION**

**3.01 INSTALLATION**

- A. Hardware Mounting Heights: Door and Hardware Institute "Recommended Locations for Builders Hardware for Standard Steel Doors and Frames", except as otherwise indicated.
- B. Install each hardware item to comply with manufacturer's instructions and recommendations.
- C. Set thresholds for exterior doors in full bed of butyl-rubber or polyisobutylene mastic sealant. Remove excess sealant and clean adjacent surfaces.
- D. Hardware Adjustment: General Contractor to perform final survey and adjustments one week prior to Grand Opening, and adjust hardware to proper operation and function. Instruct Owner's personnel in proper maintenance and adjustment.

**END OF SECTION**

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**Construction Specification**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Extent of glass and glazing is indicated on drawings.
- B. Types of work in this section includes glass and glazing for:
  - 1. Exterior aluminum framing construction.
  - 2. Interior aluminum framing construction.
  - 3. Exterior hollow metal doors.
  - 4. Interior doors.
  - 5. Surveillance Mirrors (if applicable).
  - 6. Automatic Door Transoms.
- C. Related Work specified elsewhere
  - 1. Section 07901 - Joint Sealers/Fillers
  - 2. Section 13070 - Bullet Resistant Protection

**1.02 SYSTEM DESCRIPTION**

- A. Provide glass and glazing that has been produced, fabricated and installed to withstand normal thermal movement, wind loading and impact loading (where applicable), without failure including loss of breakage of glass, failure of sealants or gaskets to remain watertight and airtight, deterioration of glass and glazing materials and other defects in the work.

**1.03 QUALITY ASSURANCE**

- A. Glazing Standard: Comply with FGMA "Glazing Manual" and "Sealant Manual".
- B. Safety Glazing Standard: Comply with ANSI Z97.1 and testing requirements of 16 CFR Part 1201 for category II materials.
- C. Fire Resistance Rated Wire Glass: Provide UL-labeled and listed products, identical with those tested per ASTM E 163 (UL 9).

**1.04 DELIVERY, STORAGE, AND HANDLING**

- A. Protect glass and glazing materials during delivery, storage and handling to comply with manufacturer's directions and as required to prevent edge damage to glass, and damage to glass and glazing materials from effects of moisture including condensation, of temperature changes, of direct exposure to sun, and from other causes.

**1.05 PROJECT CONDITIONS**

- A. Environmental Conditions: Do not proceed with glazing when ambient and substrate temperature conditions are outside the limits permitted by glazing material manufacturer or when joint substrates are wet due to rain, frost, condensation or other causes.
  - 1. Install liquid sealants at ambient and substrate temperatures above 40 deg. F (4.4 deg. C).

**PART 2 - PRODUCTS**

**2.01 GLASS PRODUCTS, GENERAL**

- A. Sizes: Fabricate glass of thicknesses and sizes required for glazing openings as indicated in drawings, with edge clearances and tolerances complying with recommendations of glass manufacturer.

**2.02 STANDARD GLASS TYPES**

- A. Tinted Insulated Tempered Glass:
  - 1. Outboard Glass: Tempered float glass, 1/4" thick, Type I, Class 2 (Tinted Gray), Quality-Q3.
  - 2. 1/2" air space: Insulated structural spacer system with silicone sealant
  - 3. Inboard Glass: Tempered float glass, 1/4" thick, Type I, Class 1 (Clear), Quality-Q3.
- B. Tinted Tempered Glass:
  - 1. 1/4" thick, Tempered float glass, Type I, Class 2 (Tinted Gray), Quality-Q3.
- C. Clear Tempered Glass:
  - 1. 1/4" thick, ASTM C1048, Type FT, Condition A, Type I, Class 1 (Clear), Quality-Q3.
- D. Laminated Safety Glass:
  - 1. Outboard Glass: Clear, 1/8" annealed glass, ASTM C1172.
  - 2. Interlayer: .09" PVB.
  - 3. Inboard Glass: Clear, 1/8" annealed glass, ASTM C1172.

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**Construction Specification**

- E. Acceptable Manufacturers:
  - 1. AFG Industries, Inc
  - 2. Globe-Amerada Glass Co
  - 3. Pilkington North America
  - 4. Oldcastle Building Envelope

**2.03 HURRICANE IMPACT RESISTANT GLASS (if applicable)**

- A. Glazing shall be laminated .090 interlayer, 3/16" tempered glass with edge flapped attached to frame.
- B. Frame shall have rubber gaskets both sides (no bonding of glass to frame with silicone).
- C. Only Acceptable Product (hurricane tests were based on this product only):
  - 1. Safety-Plus II as manufactured by GlassLam NGI, Inc., 1601 Blount Road, Pompano Beach, FL 33069  
Tel: (954) 975-3233, Fax: (954) 975-3225
- D. Hurricane Resistant Assemblies: All glazing requiring NOA (Notice of Acceptance) to Miami-Dade County Product Control shall bear a permanent label with the manufacture's name or logo, city, state and the following statement "Miami-Dade County Product Control Approved. All products will have successfully passed testing to the standards set forth by Miami Dade Building Code Compliance Office (BCCO) to achieve minimum Design Pressure rating of +/-70 PSF. Glass products to be supplied shall meet the requirements of NOA # 16-0208.12, Dade County Protocols TAS 201, PAS 202, and PAS 203.

**2.04 SURVEILLANCE MIRROR (if applicable)**

- A. Mirror shall include painted hardwood back, extruded gray plastic frame, ball and socket bracket and mounting bracket for ceiling, wall and countertop mounting.
- B. Acceptable Products
  - 1. CRL Convex Heavy Duty Glass Surveillance Mirror Model No. CVM8026 - 26" diameter by C.R. Laurence Co., 2503 East Vernon Ave., Los Angeles, CA 90058. Tel: (800) 421-6144.

**2.05 MISCELLANEOUS GLAZING MATERIALS**

- A. Glazing Sealant: Comply with sealant and glass manufacturers for selection of glass sealants which suit project application and installation conditions and which are compatible with surface contacted.
  - 1. Butt Joint Glazing Sealant: Silicone sealant of type recommended by glass manufacturer, color as selected by Owner. Provide primer where required.
- B. Dense Elastomeric Compression Seal Gaskets: ASTM C 864, extruded or molded neoprene, EPDM, or thermoplastic polyolefin rubber.
- C. Cellular Elastomeric Preformed Gaskets: ASTM C 509, Type II, black; extruded or molded neoprene.
- D. Cleaners, Primers and Sealers: type recommended by manufacturer of sealants/gaskets.
- E. Blocks and Spacers: Neoprene, EPDM or silicone as required for compatibility with glazing sealants; of 80 to 90 Shore A hardness for setting blocks and, for spacers and edge blocks, of hardness recommended by glass and sealant manufacturer for application indicated. Blocks and spacers shall be of the same material.

**PART 3 - EXECUTION**

**3.01 INSTALLATION**

- A. General: Comply with referenced FGMA standards and instruction of manufacturers of glass, glazing sealants, and gaskets, to achieve airtight and watertight performance, and to minimize breakage.
- B. Set units of glass in each series with uniformity of pattern, draw bow and similar characteristics.

**3.02 PROTECTION AND CLEANING**

- A. Protect glass from edge damage during handling and installation. Inspect glass during installation and discard pieces with edge damage that could affect glass performance.
- B. Protect glass from contact with contaminating substances resulting from construction operations; remove any such substances by method approved by glass manufacturer.
- C. Wash glass on both faces not more than 4 days prior to date scheduled for inspections intended to establish date of substantial completion. Wash glass by method recommended by glass manufacturer.

**END OF SECTION**



PART 1 - GENERAL

1.01 WORK SPECIFIED HEREIN

A. All labor, materials, equipment and services necessary to furnish and install all stucco, including lath, as indicated or specified.

1.02 SUBSTITUTIONS

A. In accordance with Division 1.

1.03 QUALITY ASSURANCE

- A. Comply with applicable requirements of ASTM C-926 as applicable; and Plaster, Metal Framing System, Lath Manual, Latest Edition.
- B. Allowable Tolerances: Maximum deviation from true plane of 1/8" in 10 feet as measured by straight edge placed at any location on surface.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver all products in their original packages, containers or bundles bearing the name of the manufacturer and the brand. Keep stucco and all other cementitious materials dry until ready for use, keeping them off the ground, under cover, and away from damp walls or surfaces. Remove damaged or deteriorated materials from the premises.

1.05 JOB CONDITIONS

- A. Where stucco is a component of an assembly for which a fire resistive rating is shown or required, provide stucco complying with UL design assemblies shown.
- B. Cold Weather Requirements: Do not use frozen materials in stucco mixes. Do not apply stucco to frozen surfaces or surfaces containing frost. Do not apply stucco when ambient temperature is less than 40°F.
- C. Hot Weather Requirements: Protect stucco from uneven and excessive evaporation during hot, dry weather.
- D. Exercise extreme care and provide necessary forms of protection for protecting finish work of other trades during stucco operation (in particular door and window units) from being stained, tarnished or otherwise damaged for work under this Section. Mask materials to protect same.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Portland Cement: ASTM C-150, Type I or II.
- B. Hydrated Lime: ASTM C-207, Type S.
- C. Aggregate: Clean, well graded sand or screenings from crushed stone or slag, and shall conform to ASTM C-897 for fine aggregate except that it shall be graded within the following limits:

1.	Passing No.	4 sieve	100%
2.	Passing No.	8 sieve	90%
3.	Passing No.	16 sieve	60-90%
4.	Passing No.	30 sieve	35-70%
5.	Passing No.	50 sieve	10-30%
6.	Passing No.	100 sieve	5%
- D. Metal casing beads shall be 26 gauge galvanized steel with expansion flange; No. 4, No. 60 or No. 66, or as detailed.
- E. Metal expansion joints shall be 26 gauge galvanized steel with expansion flange; (No. 15) (No. 40) for field; No. 30 for inside corners; or as detailed.
- F. Drip screed moldings shall be as manufactured by Fry Reglet Corporation, Los Angeles CA. Unit to be made of extruded aluminum 0.050" thick (recoedized) clear coating.

- G. Water shall be potable.
- H. Vapor barrier material shall be 6-mil polyethylene of 15# asphalt saturated felt.

**2.02 METAL LATH**

- A. Wood Studs: K-Lath Corporation, Aqua K-Lath or Stucco-Rite, Type SFB, standard for 16" support spacing, heavy duty for 24" support spacing.
- B. Metal Studs: K-Lath Corporation, Aqua K-Lath (or Pyro K-Lath) Type SFB, standard for 16" support spacing, heavy duty for 24" support spacing.
- C. Soffits: K-Lath Corporation, Gun lath, type F-FB, standard for 16" support spacing, heavy duty for 24" support spacing.

**2.03 CORNER REINFORCEMENT**

- A. K-Lath Corporation, Kwik Corner, for exterior angles; Bentrite welded wire mesh, 2" x 2" angle for interior angles.
- B. Tie Wire: Double annealed and galvanized conforming to Type I, FS QQ-W-461, 18 gauge.
- C. Colored finish coat shall be factory-mixed and applied in strict accordance with manufacturer's printed instructions. Color and texture to be as per approved sample panel.
- D. Bonding Agent: Thorobond as manufactured by Thoro System Products, Newark CA; or Hornweld as manufactured by A.C. Horn Co., Los Angeles CA.

**2.04 PROPORTIONING AND MIXING**

- A. Mortar for all coats shall consist of one volume of Portland cement to not less than 3 or more than 4 volumes of damp, loose aggregate.
- B. Hydrated lime, hydrated lime putty, or slaked lime putty may be added as a plasticizing agent, but the amount used shall not exceed 10% by weight nor more than 25% by volume of the cement used.
- C. Measurements of ingredients shall be accurate and successive batches proportioned exactly alike. Mix aggregate, cement and other dry ingredients until the mass is uniform in color and homogenous before adding water. Determine the quantity of water necessary for the desired consistency by trial, and thereafter measure in proper proportions. Retempering of mortar will not be allowed.
- D. Mix in bonding agent per manufacturer's printed instructions.

**PART 3 - EXECUTION**

**3.01 INSPECTION**

- A. Make a detailed inspection of all areas and surfaces to be enclosed or covered by the work of this Section, and make arrangements for satisfactory correction of all defective workmanship or materials that might affect the work herein.

**3.02 LATH INSTALLATION**

- A. General: Apply with long dimension at right angles to the supports. Extend both horizontal and vertical factory laps. On walls, install first course at bottom and work up. Work from right to left. Stagger all vertical laps.
- B. Wood Framing: Attachments shall securely engage the back wire within the lath and be spaced no more than 6" o.c. on each support.
- C. Vertical Surfaces: Nails must have a minimum penetration of 3/4" into the support unless otherwise required by code. Nails to be corrosion resistant. Staples of 14 gauge galvanized wire, 1-1/4" long and 3/4" wide may be used.
- D. Horizontal and Sloping Surfaces: Nails to be galvanized 11 gauge, 1-1/2" long, barbed with 7/16" head unless otherwise required by code. All nails must be "driven home". Staples of 14 gauge galvanized wire, 1-3/8" long and 3/4" wide may be used.

**3.03 METAL FRAMING (HORIZONTAL AND VERTICAL SURFACES)**

- A. Gun Lath: Attach with hog rings or 18 gauge tie wire. Attachments must engage one or more wires in the lath and encircle or attach to the flange or face of the support at no more than 6" o.c.
- B. Aqua K-Lath or Stucco Rite: Attach with self-tapping screws with neoprene washers. Attachments must engage one or more wires in the lath and attach to the flange or face of the support at not more than 6" o.c. On vertical surfaces position fastener below and engage horizontal wire in lath.

**3.04 METAL TRIM**

- A. Where stucco terminates against dissimilar materials, install casing beads, provide continuous sealant.
- B. Install expansion joints in the stucco field as indicated, or, where not indicated, install joints to create panels no larger than 144 square feet with no dimension exceeding 18 feet or a length to width ratio of 2-1/2 to 1.
- C. Fasten metal trim by wire-tying or nailing depending on the type, style and back-up collateral material.
- D. When used with metal lath, wire ties must be used. Install trim with attachment only to the edges of abutting sheets of lath, so that the lath is not continuous or tied across the joint.
- E. Where expansion joints are placed parallel to framing members, install joints so that none is more than 4" away from a framing member.

**3.05 STUCCO APPLICATION**

- A. Apply scratch coat over metal lath with sufficient pressure so that it is shoved through the metal reinforcement against the backing to form full keys and to embed completely the reinforcement. Apply to an approximate thickness of 3/8" from the face of the backing. Scratch to provide bond for succeeding coat. Cure with water for minimum of 72 hours.
- B. Apply brown coat not sooner than 72 hours after the application of the scratch coat. Dampen scratch coat evenly to obtain uniform suction. Apply to an approximate thickness of 3/8". Bring surface to a true, even surface by floating or rodding and leave rough, ready to receive finish coat. Cure with water for minimum of 7 days.
- C. Where indicated over concrete or masonry, apply brown coat directly over concrete or masonry, proportioned as specified above. Dampen surface evenly to obtain uniform suction. Apply to an approximate thickness of 3/8". Bring surface to a true, even surface by floating or rodding, and leave rough ready to receive finish coat. Cure for 7 days by keeping moist.
- D. Apply finish coat not sooner than 7 days after the application of the preceding coat. Before applying, dampen the surface of the preceding coat evenly to obtain uniform suction. The thickness of the finish coat shall be sufficient to secure the texture specified, but in no case, less than 1/8", and the total thickness of the stucco shall be at least 7/8" from the face of the backing. Avoid excessive troweling. When applying the finish, plan work so that the entire wall can be completed at one time to eliminate joining marks. If not practical, use a corner, door or window as a breaking point. Texture and color of finish coat shall match approved sample. Finish to be match center - where applicable or verify with Architect.

**3.05 CURING**

- A. Keep each coat of stucco damp for at least 72 hours (brown coat 7 days) after application. Moistening of each coat shall begin as soon as the stucco has hardened sufficiently so as not to be injured. Apply water in a fine fog spray. Avoid soaking the wall. Apply only as much water as can be readily absorbed. Protect stucco from uneven and excessive evaporation during hot, dry weather and also from strong blasts of wind.

**3.06 PATCHING**

- A. Stucco containing cracks, blisters, pits or discoloration will not be acceptable. Remove such stucco and replace with stucco conforming to the requirements of this Specification. Patching inherently defective work will be permitted only when approved and such patching shall match existing work in texture and colors. Repair all defects after other trades have finished their work.

**END OF SECTION**

**PART 1 - GENERAL****1.01 SUMMARY**

- A. Extent of each type of gypsum drywall construction required as indicated on Drawings.
- B. This section includes the following:
  - 1. Interior Gypsum Board
  - 2. Exterior Gypsum Board
- C. Related work specified elsewhere includes but may not be limited to:
  - 1. Section 01012: Preferred Purchasing
  - 2. Section 05400: Cold Formed Metal Framing
  - 3. Section 07201: Building Insulation

**1.02 REFERENCES**

- A. Unless other wise shown or specified, this work shall conform to the following standards:
  - 1. ASTM C472 - Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters and Gypsum Concrete.
  - 2. ASTM C473 - Standard Test Methods for Physical Testing of Gypsum Panel Products.
  - 3. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
  - 4. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board.
  - 5. ASTM C1177 - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
  - 6. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.
  - 7. ASTM E661 - Standard Test Method for Performance of Wood and Wood-Based Floor and Roof Sheathing Under Concentrated Static and Impact Loads.

**1.03 PREFERRED PURCHASING**

- A. Unless noted otherwise, Contractor and all subcontractors are encouraged to purchase all products listed in this specification section from a local The Home Depot Store. For more information, refer to Section 01012.

**1.04 QUALITY ASSURANCE**

- A. Fire-Resistance Ratings: Provide gypsum drywall construction fire-resistance ratings indicated, conforming to assemblies tested per ASTM E 119 by inspecting and testing organization acceptable to authorities having jurisdiction.

**1.05 DELIVERY, STORAGE AND HANDLING**

- A. Deliver materials in original packages, container or bundles bearing brand name and identification of manufacturer or supplier.
- B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic and other causes. Neatly stack gypsum boards off the floor and flat to prevent sagging.
- C. Handle gypsum boards to prevent damage to edges, ends, and surfaces. Do not bend or otherwise damage metal corner beads and trim.
- D. Do not overload floor system.

**1.06 PROJECT CONDITIONS**

- A. Environmental Conditions, General: Establish and maintain environmental conditions for application and finishing gypsum board to comply with ASTM C 840 and with gypsum board manufacturer's recommendations.
- B. Minimum Room Temperatures: For non-adhesive attachment of gypsum board to framing, maintain not less than 40 deg F (4 deg C). For adhesive attachment and finishing of gypsum board maintain not less than 50 deg F (10 deg C) for 48 hours prior to application and continuously thereafter until drying is complete.
- C. Ventilate building spaces to remove water not required for drying joint treatment materials. Avoid drafts during dry, hot weather to prevent materials from drying too rapidly.

**PART 2 - PRODUCTS****2.01 MANUFACTURER**

- A. Subject to compliance with requirements, provide products as manufactured by the following supplies. All materials used in the

work shall be the product of a single manufacturer. Alternate manufacturers are not acceptable.

1. United States Gypsum Company

**2.02 INTERIOR GYPSUM BOARD**

- A. General: Provide gypsum board of thickness indicated on drawings and of types indicated in maximum lengths available to minimize end joints.
- B. Exposed Gypsum Board: ASTM C 36, thickness as indicated.
  1. Type: Regular.
  2. Type: Type X for fire-resistance-rated assemblies.
  3. Edges: Tapered.
- C. Water-Resistant Gypsum Backing Board: ASTM C 630, thickness as indicated.
  1. Type: Regular, (for wet areas)
  2. Type: Type X for fire-resistance-rated assemblies.
- D. Exterior Gypsum Sheathing (where indicated on drawings): ASTM C79, thickness as indicated.
  1. Edges tapered.

**2.03 GLASS-MAT FACED GYPSUM SHEATHING**

- A. General: Use products conforming to ASTM C1177
- B. Material:
  1. Thickness: 1/2 inch.
  2. Width: 4 feet.
  3. Length: 8 feet.
  4. Weight: 1900 pounds per M square feet.
  5. Edges: Square.
  6. Surfacing: Coated glass mat on face, back, and long edges.
  7. Racking Strength (Ultimate, not design value) (ASTM E72): Not less than 540 pounds per square foot, dry.
  8. Flexural Strength, Parallel (ASTM C473): 80 lbf, parallel.
  9. Humidified Deflection (ASTM C1177): Not more than 1/4 inch.
  10. Permeance (ASTM E96): 23 perms.
  11. R-Value (ASTM C518): 0.56.
- C. Acceptable Products:
  1. 1/2 inch DensGlass Gold, Georgia-Pacific Gypsum.

**2.04 GLASS-MAT FACED GYPSUM ROOF BOARD**

- A. Material:
  1. Thickness: 1/4 inch.
  2. Width: 4 feet.
  3. Length: [4 feet] [8 feet].
  4. Weight: 1.1 psf.
  5. Surfacing: Glass mat.
  6. Flexural Strength, Parallel (ASTM C473): 40 lbf, minimum.
  7. Flute Span (ASTM E661): 2-5/8 inches.
  8. Permeance (ASTM E96): Not more than 50 perms.
  9. R-Value (ASTM C518): Not less than 0.28.
  10. Water Absorption (ASTM C1177): Less than 10 percent of weight.
  11. Compressive Strength (Applicable Sections of ASTM C472): 500 - 900 pounds per square inch.
  12. Surface Water Absorption (ASTM C473): Not more than 2.5 grams.
- B. Acceptable Products:
  1. DensDeck, Georgia-Pacific Gypsum.

**2.05 TRIM ACCESSORIES**

- A. General: ASTM C 840: Mfg.'s standard trim accessories, including cornerbead and edge trim of beaded type with face flanges for concealment in joint compound except where semi-finishing or exposed types is indicated.

**B. Material:**

1. Interior Application: Formed sheet steel zinc coated.
- C. Provide one-piece control joints with 1/4 inch wide by 7/16 inch deep vee-shaped slot, covered with removable tape, of roll-formed zinc as recommended by gypsum board manufacturer.

**2.06 GYPSUM BOARD JOINT TREATMENT MATERIALS**

- A. General: ASTM C 475 and ASTM C 840 and manufacturer's recommendations of gypsum board and joint treatment materials for application indicated.
- B. Joint Tape: Paper reinforcing tape, unless otherwise indicated.
- C. Drying-T Type Joint Compounds: Factory-prepackaged vinyl-based products complying with the following requirements:
  1. Ready-Mix Formulation: Factory-premixed.

**2.07 FASTENERS**

- A. Gypsum Board Screws: ASTM C 1002.

**2.08 SECURITY MESH (EXPANDED METAL)**

- A. Install directly to stud framing behind gypsum drywall walls and/or ceilings where specified on drawings
- B. Flattened Expanded Metal:
  1. Metal: Carbon Steel
  2. Style: 3/4" - #13F (flattened)
  3. Weight: 75 lbs. per 100 sq.ft.
  4. Thickness: .070 inches
  5. Sheet size: use largest sheet size practical for intended use
- C. Fasten directly to stud framing using No. 8 self-tapping screws with 1/4" minimum penetration at 12" o. c. at perimeter and field.

**PART 3 - EXECUTION****3.01 INSTALLATION**

- A. General: Comply with ASTM C754 and ASTM C840.
- B. Do not bridge building expansion joints with support systems or gypsum board. Frame both sides of joints with furring or other supports as indicated. Leave space of the width indicated between boards, and trim both edges for installation of sealant or gasket.
- C. Secure hangers to structural support by connecting directly to structure where possible, otherwise connect to insets, clips, other anchorage devices or fasteners.
- D. Provide indirect-hung metal support system with carrying channels (main runners) spaced 4'-0" o.c., hangers 4'-0" o.c. along runners and rigid furring members 16 inches o.c., unless otherwise indicated.
- E. Where water-resistant gypsum board is used in ceilings, spacing of support members shall be 12" o.c. for 1/2" gypsum board thickness and 16" o.c. for 5/8" gypsum board thickness.
- F. Install steel studs with bottom and top runner tracks anchored to substrates. Isolate system from building structure to prevent transfer of loading and deflections into metal support system, both vertically and horizontally. Mechanically fasten vertical deflection clips to studs and anchor to primary structure in accordance with manufacturer's recommendations.
- G. Install supplementary framing, runners, furring, blocking and bracing at openings and terminations in gypsum drywall and where required for support of other work which cannot be adequately supported on gypsum board alone.
- H. Install and finish gypsum board to comply with ASTM C 840 and as follows:
  1. Install gypsum board vertically.
  2. Isolate drywall construction from abutting structural and masonry work; provide edge trim and acoustical sealant as recommended by manufacturer.
- I. Install water-resistant backing board where indicated to receive thin-set tile and similar rigid applied finishes at toilet room walls and similar "wet" areas.
- J. Screw gypsum board to metal supports.

**Construction Specification**

**GYPSUM DRYWALL**

1. Screw both layers to supports where double-layer work is indicated or otherwise required.
- K. Drywall Finishing: Apply joint tape and joint compound at joints between gypsum boards. Apply compounds indicated below at accessory flanges, penetrations, fastener heads and surface defects.
  1. Install compound in 3 coats (plus prefill of cracks where recommended by manufacturer); sand between coats and after last coat.
  2. Treat water-resistant gypsum board joints, fastener heads, cut edges and penetrations in water-resistant backing board to comply with gypsum board manufacturer's directions.
- L. Security Mesh:
  1. Install specified security mesh in accordance with manufacturer's recommendation. Screw attach to new or existing framing at 24" o.c. maximum.
  2. Sheets shall be butted together with ends and edges of sheets occurring over supports.
  3. Make cutouts for grilles, receptacles, etc. where required.

END OF SECTION

**Construction Specification****TILE****PART 1 - GENERAL****1.01 SUMMARY**

- A. Furnish all labor, materials, tools and equipment required for completing tile work and related items indicated on the drawings and herein specified.
- B. Related work specified elsewhere includes but may not be limited to:
  - 1. Section 01012 – Preferred Purchasing
  - 2. Section 07901 - Joint Sealers/Fillers
  - 3. Section 09260 - Gypsum Drywall

**1.02 PREFERRED PURCHASING**

- A. Unless noted otherwise, Contractor and all subcontractors are encouraged to purchase all products listed in this specification section from a local The Home Depot Store. For more information, refer to Section 01012.

**1.03 REFERENCES**

- A. Unless otherwise shown or specified, this work shall conform to the following standards:
  - 1. American National Standards Institute (ANSI)
    - a. ANSI A 108.1A - Specifications for Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar.
    - b. ANSI A 108.1B - Specifications for Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex Portland Cement Mortar.
    - c. ANSI A 108.1C - Specifications for Contractors Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar -or- Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex Portland Cement Mortar.
    - d. ANSI A 108.4 - Specifications for Ceramic Tile Installed with Organic Adhesives or Water-Cleanable Tile Setting Epoxy Adhesive.
    - e. ANSI A 108.5 - Specifications for Ceramic Tile Installed with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar.
    - f. ANSI A 108.6 - Specifications for Ceramic Tile Installed with Chemical-Resistant., Water-Cleanable Tile-Setting and -Grouting Epoxy.
    - g. ANSI A 108.9 - Specifications for Ceramic Tile Installed with Modified Epoxy Emulsion Mortar/Grout.
    - h. ANSI A 118.1 - Standard Specification for Dry-Set Portland Cement Mortar.
    - i. ANSI A 118.3 - Chemical-Resistant., Water-Cleanable, Tile-Setting and -Grouting Epoxy and Water-Cleanable Tile-Setting Epoxy Adhesive.
    - j. ANSI A 118.4 - Latex-Portland Cement Mortar.
    - k. ANSI A 118.5 - Chemical-Resistant. Furan Mortar and Grout.
    - l. ANSI A 118.6 - Standard Ceramic Tile Grouts.
    - m. ANSI A 118.7 - Polymer Modified Cement Grouts
    - n. ANSI A 118.8 - Modified Epoxy Emulsion Mortar/Grout.
    - o. ANSI A 118.9 - Test Methods and Specifications for Cementitious Backer Units
    - p. ANSI A 118.10 - Load bearing, Bonded, Waterproof Membranes for Thinset Ceramic Tile and Dimensional Stone.
    - q. ANSI A 118.11 - Exterior Grade Plywood (EGP) Latex-Portland Cement Mortar.
    - r. ANSI A 136.1 - Organic Adhesives for Installation of Ceramic Tile.
    - s. ANSI A 137.1 - Specifications for Ceramic Tile.
  - 2. ASTM International:
    - a. ASTM C 1008 - Test method for Determining the Static Coefficient of Friction or Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull meter Method.
    - b. ASTM D 87 - 09(2014) Standard Test Method for Melting Point of Petroleum Wax
    - c. ASTM D 4397 - Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications.
  - 3. TCA Handbook for Ceramic Tile Installation by Tile Council of America, current edition.

**1.04 SUBMITTALS TO CONTRACTOR**

- A. Submit under provisions of Section 01300.
- B. Manufacturer's data sheets on each product to be used, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation methods.
  - 4. Maintenance Data: Include stain removal methods.
- C. Shop Drawings:
  - 1. Indicate tile layout, patterns, color arrangement, perimeter conditions, and junctions with dissimilar materials, thresholds, and setting details.
  - 2. Locate and detail expansion and control joints.



**Construction Specification****TILE****1.05 QUALITY ASSURANCE**

- A. Maintain one copy each of all Referenced standards and specifications on site. Include the TCA Handbook, ANSI A108 Series, ANSI A118 Series ANSI A136.1 and ANSI A137.1 and others as specified under paragraph References.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum five years experience.
- C. Single Source Responsibility:
  - 1. Obtain each type and color tile material required from single source.
  - 2. Obtain setting and grouting materials from one manufacturer to ensure compatibility.
  - 3. Obtain prefabricated edge protection, transition, and movement profiles from one manufacturer to ensure compatibility.
- D. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from a single manufacturer and each aggregate from one source or producer.
- E. Source Limitations for Other Products: Obtain each of the following products specified in this Section through one source from a single manufacturer for each product:
  - 1. Waterproofing.
  - 2. Joint sealants.
  - 3. Metal edge strips.
- F. Certifications:
  - 1. Submit "Master Grade Certificate" for each type of ceramic, porcelain and paver tile in accordance with requirements of ANSI A 137.1.
  - 2. Submit manufacturer's certifications that mortars, adhesives, and grouts are suitable for intended use.
- G. Conform to ANSI Recommended Standard Specifications for Ceramic Tile - A 137.1.
- H. Conform to TCA Ceramic Tile: The Installation Handbook.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Labeling: Comply with ANSI A 137.1.
- B. Deliver materials in manufacturer's unopened containers, fully identified with name, brand, type, and grade.
- C. Protect materials from contamination, dampness, freezing, or overheating in accordance with manufacturer's instructions.
- D. Broken, cracked, chipped, stained, or damaged tile will be rejected, whether built-in or not.
- E. Protect mortar and grout materials against moisture, soiling, or staining.
- F. Handle tile that has temporary protective coating on exposed surfaces to prevent coated surfaces from contacting backs or edges of other units. If coating does contact bonding surfaces of tile, remove coating from bonding surfaces before setting tile.

**1.07 PROJECT CONDITIONS**

- A. Comply with requirements of referenced standards and recommendations of material manufacturer's for environmental conditions before, during, and after installation.
- B. Do not begin installation until building is completely enclosed and HVAC system is operating and maintaining temperature and humidity conditions consistent with "after occupancy" conditions for a minimum of 2 weeks.
- C. Maintain continuous and uniform building temperatures of not less than 50 degrees F or more than 100 degrees F. during installation.
- D. Ventilate spaces receiving tile in accordance with material manufacturer's instructions.

**PART 2 - PRODUCTS****2.01 MATERIALS - GENERAL**

- A. ANSI Standard for Ceramic Tile: Comply with ANSI A 137.1 "American National Standard Specifications for Ceramic Tile" for types, compositions, and grades of tile indicated.
  - 1. Furnish tile complying with "Standard Grade" requirements unless otherwise indicated.
- B. ANSI Standard for Tile Installation Materials: Comply with ANSI standard referenced with products and materials indicated for

**Construction Specification****TILE**

setting and grouting.

**2.02 TILE****A. Acceptable Manufacturers:**

1. American Marazzi Tile, Inc.

**B. Acceptable Products:**

1. Refer to drawings for size, style and color.
2. Cove Base: Cove base profile ICT RUST CB-6X8 COVE BASE is only available through special order. Contact a local The Home Depot store and provide them with the American Marazzi contact listed below.

John Beckley, Director Corporate Accounts  
5000 Highlands Parkway, Suite 190  
Smyrna, GA 30082  
Office: (770) 799-1058 x 223  
Fax: (770) 799-1066  
E-Mail: jbeckley@marazzitile.com

**2.03 EDGE-PROTECTION AND TRANSITION PROFILES****A. Acceptable Products:**

1. Schluter: Reno-Ramp AERP 125 B90
  - a. Refer to construction drawings for size and location.

**2.04 SETTING ADHESIVE MATERIALS****A. Mortar:**

1. Single-component, tile setting adhesive.
2. Mortar shall comply with ANSI A118.4 and ANSI A118.11

**B. Acceptable Products:**

1. Wall Thinset:
  - a. Mapei: Ultraflex LFT
2. Floor Thinset:
  - a. Mapei: Ultracontact

**2.05 GROUTING MATERIAL****A. Epoxy Grout:**

1. Chemical resistant, water cleanable, tile grouting epoxy.
2. Epoxy Grout shall comply with ANSI A118.3 and be capable of resisting continuous and intermittent exposure to temperatures of up to 140 degrees F and 212 degree F respectively, as certified by Mortar manufacturer for intended use.

**B. Acceptable Products:**

1. Mapei: Kerapoxy epoxy mortar and grout
  - a. Color: Refer to drawings

**2.06 FLOOR TO BASE SEALANT****A. Acceptable Products:**

1. Mapei: Keracaulk S
  - a. Color: to match adjacent grout.

**2.07 GROUT AND TILE CLEANER****A. Acceptable Products:**

1. Aqua Mix: Concentrated Stone & Tile Cleaner

**B. Acid based cleaning products are prohibited.**

**Construction Specification****TILE****2.08 MISCELLANEOUS MATERIALS**

- A. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.
- B. Metal Edge Strips:
  - 1. Schluter: Rondec Profile RO 125 AMGB
- C. Temporary Protective Coating: Either product indicated below that is formulated to protect exposed surfaces of tile against adherence of mortar and grout; compatible with tile, mortar, and grout products; and easily removable after grouting is completed without damaging grout or tile.
  - 1. Petroleum paraffin wax fully refined and odorless, containing at least 0.5 percent oil with a melting point of 120 to 140 degrees F (49 to 60 degrees C) per ASTM D 87.
  - 2. Grout release in form of manufacturer's standard proprietary liquid coating that is specially formulated and recommended for use as temporary protective coating for tile.

**2.09 MIXING MORTARS AND GROUT**

- A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturer's written instructions.
- B. Add materials, water, and additives in accurate proportions.
- C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

**PART 3 - EXECUTION****3.01 EXAMINATION**

- A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.
  - 1. Verify that substrates for setting tile are firm; dry; clean; free of oil, waxy films, and curing compounds; and within flatness tolerances required by referenced ANSI A 108 Series of tile installation standards for installations indicated.
  - 2. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed before installing tile.
  - 3. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

**3.02 PREPARATION**

- A. Remove coatings, including curing compounds and other substances that contain soap, wax, oil, or silicone, that are incompatible with tile-setting materials.
- B. Provide concrete substrates for tile floors installed with thin-set mortar that comply with flatness tolerances specified in referenced ANSI A 108 Series of tile installation standards.
  - 1. Fill cracks, holes, and depressions with trowelable leveling and patching compound according to tile-setting material manufacturer's written instructions. Use product specifically recommended by tile-setting material manufacturer.
  - 2. Remove protrusions, bumps, and ridges by sanding or grinding.
- C. Scarify concrete substrates with blast track equipment if necessary to completely remove curing compounds or other substances that would interfere with proper bond of setting materials. Clean and maintain substrate in condition required by setting material manufacturer.
- D. Field-Applied Temporary Protective Coating: Where indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, precoat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

**3.03 INSTALLATION GENERAL**

- A. ANSI Tile Installation Standards: Comply with parts of ANSI A 108 Series "Specifications for Installation of Ceramic Tile" that apply to types of setting and grouting materials and to methods indicated in ceramic tile installation schedules.
- B. TCA Installation Guidelines: TCA's "Handbook for Ceramic Tile Installation." Comply with TCA installation methods indicated in ceramic tile installation schedules.
- C. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions, unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint

**Construction Specification****TILE**

alignments.

- D. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
- E. Jointing Pattern: Lay tile in grid pattern, unless otherwise indicated. Align joints when adjoining tiles on floor, base, walls, and trim are same size. Lay out tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths, unless otherwise indicated.
- F. Expansion Joints: Locate expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.
  - 1. Locate joints in tile surfaces directly above joints in concrete substrates.
  - 2. Prepare joints and apply sealants to comply with requirements in Section 07901, Joint Sealers-Fillers.
- G. Grout tile to comply with ANSI A 108.6.

**3.04 FLOOR TILE INSTALLATION**

- A. General: Install tile to comply with requirements in the Floor Tile Installation Schedule, including those referencing TCA installation methods and ANSI A 108 Series of tile installation standards.
  - 1. For installations indicated below, follow procedures in ANSI A 108 Series tile installation standards for providing 95 percent mortar coverage.
  - 2. Tile floors in wet areas.
  - 3. Tile floors composed of tiles 8 by 8 inches (200 by 200mm) or larger.
  - 4. Tile floors composed of rib-backed tiles.
- B. Joint Widths: Install tile with 3/8 inch (9.5mm) joint widths.
- C. Metal Edge Strips: Install at locations indicated or where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with top of tile.

**3.05 WALL TILE INSTALLATION**

- A. Over gypsum wallboard on wood or metal studs install in accordance with TCA Handbook Method W243, thin-set with dry-set or latex-portland cement bond coat, unless otherwise indicated.
- B. Joint Widths: Install tile with 1/4 inch or 3/8 inch (9.5mm) joint widths.

**3.06 COVE BASE INSTALLATION**

- A. Cove base shall be miter cut at inside and outside corners of walls.

**3.07 CLEANING AND PROTECTING**

- A. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces in accordance with manufacturer's written instructions so they are free of foreign matter.
  - 1. Remove grout residue from tile as soon as possible.
  - 2. Clean grout smears and haze from tile according to grout manufacturer's written instructions. Use only cleaners recommended by grout manufacturer and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.
  - 3. If applicable, remove temporary protective coating by method recommended by coating manufacturer. Trap and remove coating to prevent it from clogging drains.
- B. When recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear.
- C. Prohibit foot traffic from tiled floors for at least 24 hours and wheel traffic from tiled floors for at least 72 hours after grouting is completed.
- D. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.

END OF SECTION

**PART 1 - GENERAL****1.01 SUMMARY**

- A. Extent of acoustical ceilings is indicated on drawings and schedules and includes the following types:
  - 1. Lay-in mineral composition panels, exposed "T" grid.
- B. Related work specified elsewhere includes but may not be limited to:
  - 1. Section 01012: Preferred Purchasing
  - 2. Division 15: Grilles, registers, and diffusers in acoustical ceilings.
  - 3. Division 16: Lighting fixtures in acoustical ceilings.

**1.02 PREFERRED PURCHASING**

- A. Unless noted otherwise, Contractor and all subcontractors are encouraged to purchase all products listed in this specification section from a local The Home Depot Store. For more information, refer to Section 01012.

**1.03 QUALITY ASSURANCE**

- A. Installer Qualifications: Engage an experience Installer who has successfully completed acoustical ceilings similar in material, design, and extent to those indicated for Project.
- B. Allowable Tolerances
  - 1. Surfaces to receive acoustical treatment shall be free from irregularities and level to within 1/4" in 12 ft.
  - 2. Deflection
    - a. Suspension system components, hangers and fastening devices supporting light fixtures, ceiling grilles and acoustical units shall have maximum deflection 1/360 of the span.
    - b. Deflection Test ASTM C635-95.
- C. Single-Source Responsibility for Ceiling Units: Obtain each type of acoustical ceiling unit from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the Work.
- D. Coordination of Work: Coordinate layout and installation of acoustical ceiling units and suspension system components with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system components (if any), and partition system (if any).

**1.04 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver acoustical ceiling units to project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical ceiling units, permit them to reach room temperature and a stabilized moisture content.
- C. Handle acoustical ceiling units carefully to avoid chipping edges or damaging units in any way.

**1.05 PROJECT CONDITIONS**

- A. Space Enclosure: Do not install interior acoustical ceilings until space is enclosed and weatherproof, wet-work in space is completed and nominally dry, work above ceilings is complete, and ambient conditions of temperature and humidity will be continuously maintained at values near those indicated for final occupancy.

**1.06 EXTRA MATERIALS**

- A. Deliver extra materials to Owner. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with appropriate labels.
  - 1. Acoustical Ceiling Panels: Furnish 3 full boxes of each type.

**PART 2 - PRODUCTS****2.01 SUSPENSION SYSTEM**

- A. Acceptable Products
  - 1. USG Interiors, Inc.: "Donn DX"
- B. Types

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**Construction Specification**

Section 09510  
**ACOUSTICAL CEILINGS**

1. 24" x 48" exposed grid
  2. ASTM C635-00.
  3. Structural Classification: Intermediate Duty.
  4. All components are to be products of one manufacturer.
- C. Edge Molding: Minimum 0.020" steel, channel or angle shaped with minimum flange width of 7/8", painted low sheen satin white. Flanges shall have hemmed edges.
- D. Suspension Accessories
1. Hanger Wire: Minimum 12 gauge, galvanized, soft-annealed, milled steel wire.
  2. Wire Ties: 18 gauge, galvanized annealed steel wire.
  3. Hanger Clips: Prefabricated metal clamps for fastening to steel structure. Drilled expansion sleeves for fastening to metal deck.
  4. Seismic Restraint: Galvanized steel tubing or conduit, sized and spaced by the suspension system manufacturer in accordance with requirements of authority having jurisdiction, sleeved around wires to resist lateral and vertical movement. (As required by local jurisdiction or seismic conditions)

**2.02 ACOUSTICAL CEILING TILE**

- A. Acceptable Products:
1. USG Interiors, Inc.: #562 Fissured (#280 Fifth Avenue)
- B. Size: 24" x 48" x 5/8" thickness.
- C. Edges: Square edge, four sides.
- D. Finish: Factory applied, washable paint, color: white.

**PART 3 - EXECUTION****3.01 INSPECTION**

- A. Examine surfaces designated to receive work described in this Section for conditions adversely affecting the finished work. Repair or replace surfaces not meeting tolerances or quality requirements imposed within specifications governing substrate construction prior to initiating this work.

**3.02 INSTALLATION**

- A. General: Install acoustical ceiling systems to comply with ASTM C 636 as applicable to type for system and in accordance with manufacturer's instructions and CISCA "Ceiling Systems Handbook".
- B. Layout: Balance ceiling borders on opposite sides using more-than-half-width acoustical units.
- C. Tolerance: 1/8 - inch in 12'-0" level tolerance.
- D. Suspension System: Secure to building structure, with hangers spaced as recommended by manufacturer and applicable standards.
- E. Edge Moldings: Install edge molding secured to substrate. Miter corner joints.
- F. Cope exposed edges intersecting exposed suspension members to produce flush intersections.
- G. Install seismic restraints in compliance with requirements of authority having jurisdiction.

**3.03 CLEANING**

- A. Clean exposed surfaces of acoustical ceilings, including trim, edge moldings and suspension members. Comply with manufacturer's instructions for cleaning.
- B. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

**END OF SECTION**

**Construction Specification****EXTERIOR LINEAR METAL SOFFIT SYSTEM****PART 1 - GENERAL****1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

**1.02 SUMMARY**

- A. Section Includes:

1. Perforated and un-perforated metal ceiling panels
2. Suspension systems
3. Accessories; provide other necessary items including devices for attachment overhead construction, secondary members, splines, splices, connecting clips, wall connectors, wall angles, and other devices required for a complete installation.
4. Supplemental support framing; Provide fully engineered secondary framing as required to meet code, conforming to layout shown in drawings, to support direct-hung metal ceilings suspension system.
5. Coordinate layout and installation of items penetrating or being installed in ceiling systems with responsible trades.

- B. Related Sections / Work:

1. Section 05400 – Cold Formed Metal Framing
2. Section 09260 – Gypsum Board Drywall
3. Section 09510 – Acoustical Ceilings
4. Section 09900 – Painting
5. Division 23 – Heating, Ventilating and Air Conditioning
6. Division 26 – Electrical

- C. Alternates (Substitutions):

1. Prior approval: unless otherwise provided for in the contract documents, proposed product substitutions may be submitted no later than 10 working days prior to the date established for receipt of bids. Approval of a proposed substitution is contingent upon the Architect's review of the proposal for acceptability. Approved products will be set forth by addenda. If substitute products have not been approved by addenda, but are included in a bid, the specified products shall be provided without additional compensation.
2. Submittals which do not provide adequate data for the product evaluation will not be considered. The proposed substitution must meet the requirements for this section, including but not necessarily limited to the following: single source materials supplier (if specified in Section 1.5); panel design, size, composition, color and finish; suspension system component profiles and sizes; and compliance with the referenced standards

- D. This Section covers the general requirements only for Acoustical Metal Ceilings as shown on the drawings. The supplying and installation of additional accessory feature and other items not specifically mentioned herein, but which are necessary to make a complete installation shall also be included or clarified accordingly.

- E. Qualification Data:

1. Test Reports: Certified reports from independent agency substantiating structural compliance to wind loads and other governing requirements.
2. Certificates:
  - a. Data substantiating manufacturer and installer qualifications.
  - b. Certified data attesting fire rated materials comply with specifications.
3. Manufacturer's Instructions: Detailed installation instructions and maintenance data.

**1.03 REFERENCES**

- A. American Society for Testing and Materials (ASTM)

1. E 84 – "Standard Test Method for Surface Burning Characteristics of Building Materials"
2. E 488 – "Standard Test Methods for Strength of Anchors in Concrete and Masonry Elements"
3. B 209 – "Standard Specification for Aluminum and Aluminum Alloy Sheet and Plate"
4. C 423 – "Sound Absorption and Sound Absorption Coefficients by Reverberation Room Method"
5. E 580 – "Standard Practice for Application of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Requiring Moderate Seismic Restraint"
6. C 635 – "Standard Specification for Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings"
7. C 636 – "Recommended Practice for Installation of Metal Ceiling Suspensions Systems for Acoustical and Lay-in Panels"
8. A 641 – "Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire"
9. A 653 – "Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvamealed) by the Hot-Dip process.
10. E 1264 – Classification for Acoustical Ceiling Products"
11. E 1477 – Standard Test Method for Luminous Reflectance factor of Acoustical Materials by use of Integrating-Sphere Reflectometers"

**Construction Specification****EXTERIOR LINEAR METAL SOFFIT SYSTEM**

12. D 1044 – Practice for Abrasion Resistance
13. D 1002 – Practice for Adhesion Resistance

**1.04 SUBMITTALS**

- A. Product Data: Manufacturer's published literature, including specifications.
- B. Product Certification: Manufacturer's certifications that products comply with specified requirements and governing codes including product data, laboratory test reports and research reports showing compliance with specified standards.
- C. Shop Drawings: Submit shop drawings for reflected ceiling plans (RCP's), drawn to scale, and indicating penetrations and ceiling mounted items. Show the following details:
  1. Reflected Ceiling Plan(s): Indicating metal ceiling layout, ceiling mounted items and penetrations.
  2. Suspension System, Carrier and Component Layout.
  3. Details of system assembly and connections to building components.
- D. Samples for Verification: Full-size units (or as specified below) of each type of ceiling assembly indicated; in sets for each color, texture, and pattern specified, showing the full range of variations expected in these characteristics. Submit samples for each type specified.
  1. 11-inch square metal panel units.
  2. 11 inch long samples of each exposed molding or trim.
  3. 11-inch long samples of each suspension component.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer/Installer Qualifications:
  1. Provide metal ceiling system components produced by a single manufacturer with a minimum 5 years experience in actual production of specified products and with resources to provide consistent quality in appearance and physical properties, without delaying the work.
  2. Provide suspension system components produced by a single manufacturer to provide compatible components for a complete metal ceiling system installation.
  3. Perform installations using a firm with installers having no less than 3 years of successful experience on projects of similar size and requirements.
- B. Regulatory Requirements:
  1. Fire Rating Performance Characteristics: Install system to provide a flame spread of 0 - 25, complying with certified testing to ASTM E 84.
  2. Structural Criteria: Install and certify system to comply with structural and wind load requirements of governing codes.
  3. Installation Standard for Suspension System: Comply with ASTM C 636.
- C. Mock-Up: Prior to beginning installation erect a mock-up section, where directed, using all system components.
- D. Pre-installation Conference: Conduct a conference, prior to start of installation, to review system requirements, shop drawings, and all coordination needs.

**1.06 DELIVERY, STORAGE AND HANDLING**

- A. Deliver system components in manufacturer's original unopened packages, clearly labeled.

- B. Store components in fully enclosed dry space. Carefully place on skids, to damage from moisture and other construction activities.

- C. Handle components to prevent damage to surfaces and edges, and to prevent distortion and other physical damage.

**1.07 PROJECT CONDITIONS**

- A. Begin system installations only after spaces are enclosed and weather-tight, and after all wet work and overhead work have been completed.
- B. Prior to starting installations, allow materials to reach ambient room temperature and humidity intended to be maintained for occupancy.

**1.08 WARRANTY**

- A. Provide specified manufacturer's warranty against defects in workmanship, discoloration, or other defect considered undesirable by the Architect or Employer.



**Construction Specification****EXTERIOR LINEAR METAL SOFFIT SYSTEM**

- B. This warranty shall remain in effect for a minimum period of one (1) year from date of initial acceptance.

**1.09 MAINTENANCE & EXTRA MATERIALS**

- A. Maintenance Instructions: Provide manufacturers standard maintenance and cleaning instructions for finishes provided.
- B. Extra Materials: Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels describing contents. Only typical system components are included with attic stock.
1. Acoustical Metal Ceiling Pan Units: Full-size units equal to 2 percent (2%) of amount installed.
  2. Ceiling Suspension System Components: Quantity of each grid and exposed component equal to 2 percent (2%) of amount installed.

**PART 2 - PRODUCTS****2.01 MANUFACTURER**

- A. Provide "Luxalon" Linear Plank metal ceiling system manufactured by Hunter Douglas Architectural Products, Inc., 5015 Oakbrook Parkway, Suite 100, Norcross, GA 30093, USA. Ph. (800) 366-4327.

**2.02 CEILING PANEL MATERIALS**

- A. Panel type:
1. Panel 300C: Roll formed aluminum, .028 inches thick, 11.811 inches (300mm) wide, fabricated to provide a beveled edge joint between panels when installed.
- B. Panel length: Standard 12 feet
- C. Perforation (as show on drawings):
1. Available Finishes: Non-perforated, Perf 124, and Perf 160
- D. Panel Finish
1. Paint: color to be selected by architect
    - a. Available Finishes: Applied Polyester, Powder coat, or Luxacote

**2.03 SUSPENSION SYSTEM MATERIALS**

- A. Suspension System:
1. 300C Panel concealed carrier suspension system: Formed, inverted V-shaped, 0.95 mm (0.040 inch) thick roll-formed aluminum, by 62 mm (2.45 inch) high carrier sections. Pre-punch carrier cross sections, that are to receive ceiling panels, with prongs for snap attachment and support of panel side edges.
    - a. Provide manufacturer's standard metal carrier suspension system components, including splices, connector wire clips, hanger rods and adjustment springs, PVC closing pieces and trim for panel end attachment to wall.
- B. Seismic Struts: Verify and insert proper sizes required to comply with governing codes, as designed by registered structural engineer.

**2.04 CEILING SYSTEM ACCESSORY MATERIAL**

- A. Edge Trim: Manufacturer's standard edge trim moldings.

**PART 3 - EXECUTION****3.01 EXAMINATION**

- A. Examine substrates and structural framing to which acoustical metal panels attach or abut, with installer present, for compliance with requirements specified in this and other Sections that affect installation and anchorage, and other conditions affecting performance of metal panel ceilings.

- B. Proceed with installation only after unsatisfactory conditions have been corrected.

**3.02 PREPARATION**

- A. Coordination: Furnish layouts for cast-in-place anchors, clips, and other ceiling anchors whose installation is specified in other Sections.
- B. Measure each ceiling area and establish layout of acoustical metal pan units to balance border widths at opposite edges of

**Construction Specification****EXTERIOR LINEAR METAL SOFFIT SYSTEM**

each ceiling. Avoid using less-than-half-width units at borders, and comply with layout shown on reflected ceiling plans.

- C. Survey substrate for wall attachment to assure squareness and proper elevation for wall panel installation.

### 3.03 INSTALLATION

- A. General: Install acoustical metal pan ceilings, per manufacturers shop drawings provided, per manufacturer's written instructions and to comply with publications referenced below.

1. CISCA "Ceiling Systems Handbook.
2. Standard for Ceiling Suspension System Installations - ASTM C 636.
3. Standard for Ceiling Suspension Systems Requiring Seismic Restraint - ASTM E 580
4. IBC (International Building Code) standard for Seismic Zone for local area.

- B. Suspend ceiling hangers from building's approved structural substrates and as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, counter-splaying, or other equally effective means.
3. Where width of ducts and other construction within ceiling plenum produce hanger spacings that interfere with location of hangers at spacing required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
4. Where used secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure; that are appropriate for substrate; and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
5. Space hangers not more than 48 inches on center, along each member supported directly from hangers, unless otherwise indicated; and provide hangers not more than 8 inches from ends of each member. Supply supporting calculations from licensed Structural Engineer verifying hanger spacing meets all requirements, when spacing exceed those recommended.
6. Fine level grid to 1/8 inch in 10 feet from specified elevation(s), square and true.
7. Adjust suspension system runners so they are square (within .5 degree from 90 degrees) and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

- C. Secure bracing wires to ceiling suspension members and to supports acceptable to Architect / Engineer and or Inspector. Suspend bracing from building's structural members and / or structural deck, as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs(unless directed otherwise).

- D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical metal pan. Method of edge trim attachment and design of edge trims to be approved by Architect.

1. Screw attach moldings to substrate at intervals not more than 18" O.C. and not more than 6" from ends, leveling with ceiling suspension system to a tolerance of 1/8" in 10'. Miter corners accurately and connect securely.
2. Do not use exposed fasteners, including pop rivets, on moldings and trim without prior written approval. Or unless detailed otherwise.

- E. Scribe and cut acoustical metal panel units for accurate fit at penetrations by, other work through ceilings. Stiffen edges of cut units as required to eliminate evidence of buckling or variations in flatness exceeding referenced standards for stretcher-leveled metal sheet.

- F. Install acoustical metal panel units in coordination with suspension system.

1. Align joints in adjacent courses to form uniform, straight joints parallel to room axis in both directions, unless otherwise indicated. Install directionally patterned or textured panels in directions indicated on approved shop drawings. Panel-joints shall flow smoothly and in a straight line within 1/8" in 10'. Intersections shall be continuous.
2. Fit adjoining units to form flush, tight joints. Scribe and cut units for accurate fit at borders and around construction penetrating ceiling.
3. Remove protective film from panels only when space is completely clean and free of airborne particles. Use white cotton gloves for final installation of panels into grid system.

### 3.04 ADJUST AND CLEAN

- A. Adjust components to provide uniform tolerances.
- B. Replace all ceiling panels that are scratched, dented or otherwise damaged.
- C. Clean exposed surfaces with non-solvent, non-abrasive commercial type cleaner.

### END OF SECTION

**PART 1 - GENERAL****1.01 SUMMARY**

- A. Extent of vinyl base and accessories is shown on drawings and in schedules.
- A. Related work specified elsewhere includes but may not be limited to:
  - 1. Section 01012: Preferred Purchasing

**1.02 PREFERRED PURCHASING**

- A. Unless noted otherwise, Contractor and all subcontractors are encouraged to purchase all products listed in this specification section from a local The Home Depot Store. For more information, refer to Section 01012.

**1.02 QUALITY ASSURANCE**

- A. Engage installer who has had not less than 3 years successful experience in the installation of resilient flooring and base similar in type and scope of this Project.

**1.03 PROJECT CONDITIONS**

- A. Maintain minimum temperature of 70 deg. F in spaces to receive vinyl base for at least 24 hours prior to installation, during installation, and for not less than 48 hours after installation. Maintain minimum temperature of 55 deg. F in areas where work is completed.

**PART 2 - PRODUCTS****2.01 BASE MATERIALS**

- A. Acceptable Products:
  - 1. Roppe: Vinyl Wall Base
- B. Description:
  - 1. Height: 4" as indicated on the plans.
  - 2. Style: Cove.
  - 3. Color: As indicated in drawings

**2.02 APPLICATION MATERIALS**

- A. Adhesive: VOC compliant for building location. Type and brand recommended by manufacturer.
- B. Cleaner: As recommended by manufacturer.

**PART 3 - EXECUTION****3.01 INSPECTION AND SURFACE PREPARATION**

- A. Contractor shall be responsible to insure that ALL surfaces receiving subsequent finish are prepared in accordance with manufacturers' recommendations.
- B. Contractor shall immediately, give written notification, of any incompatibilities between materials or surfaces. Commencement of Application implies acceptance of the surface and shall constitute waiver by the respective contractor and general contractor to any claim of incompatibility.

**3.02 INSTALLATION**

- A. Surface Preparation: Contractor shall be responsible for preparing surfaces scheduled to receive vinyl base.
- B. Installation: Install in strict accordance with manufacturer's recommendations for type(s) of materials, projects conditions, and intended use.
- C. Apply adhesive recommended by manufacturer in strict accordance with manufacturer's instructions.
- D. Apply wall base in lengths as long as practicable to walls, columns, and all permanent fixtures where indicated. Mitered outside corners not acceptable.
  - 1. On masonry or other irregular surfaces, fill voids behind base and along top edge with manufacturer's recommended adhesive filler.

END OF SECTION

**Construction Specification****TACTILE WARNING SURFACING****PART 1 - GENERAL****1.01 SUMMARY**

- A. Section includes the furnishing and installing of truncated dome tactile warning surfacing.
- B. Related Sections include, but not limited to:
  - 1. Section 02513: Asphalt Concrete Paving
  - 2. Section 02529: Portland Concrete Paving

**1.02 REFERENCE STANDARDS**

- A. Americans with Disabilities Act Accessibility Guidelines (ADAAG).  
Provide tactile warning surfaces, which comply with the detectable warnings on walking surfaces, section of the Americans with Disabilities Act (Title 49 CFR TRANSPORTATION, PART 37.9 STANDARDS FOR ACCESSIBLE TRANSPORTATION FACILITIES, Appendix A, Section 4.29.2 DETECTABLE WARNINGS ON WALKING SURFACES).
- B. California Code of Regulations (CCR) (where applicable):  
Provide only approved DSAAC detectable warning products as provided in the California Code of Regulations (CCR), Title 24, Part 1, Articles 2, 3 and 4 and Part 2, Section 205 definition of "Detectable Warning". Section 1127B.5 for "Curb Ramps" and Section 1133B.8.5 for "Detectable Warnings at Hazardous Vehicle Area's". DSAAC Interpretive ruling 11B-3 & 11B-4

**1.03 SUBMITTALS TO CONTRACTOR**

- A. Samples: Submit samples of tactile warning surfacing, 6 x 6 inches minimum, in pattern and color specified.
- B. Product Literature: Submit manufacturer's Product data for each specified product, including installation instructions
- C. Maintenance Instructions: Submit copies of manufacturer's specified maintenance practices for each type of product and accessory as required.
- D. Installer Qualifications: Submit evidence that installer meets specified requirements.
- E. Warranty: Submit executed warranty.
- F. Extra Stock Materials: Submit extra pigmented sealer and clear finish sealer in sufficient quantities to recoat tactile warning surfacing.

**1.04 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver components in manufacturer's original packaging. Protect adhesives and coatings from freezing and temperatures in excess of 120 degrees F.

**1.05 FIELD CONDITIONS**

- A. Do not install on damp substrates or when ambient or substrate temperatures are below 55 degrees F or above 95 degrees F.

**1.06 WARRANTY**

- A. Submit manufacturer's executed five-(5) year limited material warranty.

**PART 2 - PRODUCTS****2.01 MANUFACTURERS**

- A. Provide SafetyStepTD Tactile Warning Surfacing System manufactured by SafetyStepTD, Cotton, CA; [www.SafetyStepTD.com](http://www.SafetyStepTD.com); phone 866-723-3883; Contact: [Leslie Hager](mailto:Leslie Hager); email: [leslie@safetystepid.com](mailto:leslie@safetystepid.com).
- B. Substitutions: Not Allowed.

**2.02 REGULATORY REQUIREMENTS**

- A. Tactile warning surfacing shall comply with ADAAG and CCR (where applicable) requirements.

**Construction Specification****TACTILE WARNING SURFACING**

- B. Tiles: ADA and CCR compliant. The sheet shall incorporate an in-line dome pattern of truncated domes 0.2" in height, 0.9" diameter at the base, and 0.4" diameter at top of dome spaced 2.35" nominal as measured on a diagonal and 1.70" nominal as measured side by side. For wheelchair safety the field area shall consist of a non-slip surface with a minimum of 40 - 90° raised points 0.045" high, per square inch.

**2.03 COMPONENTS****A. Mats:**

1. Model: SSTD-Mat.
2. Fabrication: Pre-molded sheet manufactured from flexible, polymer concrete with glass fiber mesh reinforcing; color shall be compatible with pigmented sealer color.
3. Truncated Domes: 0.9 inch diameter base and 0.45 inch diameter top, 0.2 inch high, and with beveled edges.
  - a. Pattern: Inline (Square) Pattern: 1.67 inches on center each way.

**B. Adhesive:**

1. Model: SSTD-589.
2. Type: Water-based acrylic adhesive.
3. In cold weather, use manufacturer's accelerated curing adhesive.

**C. Sand:**

1. Model: SSTD-30.
2. Type: Clean, silver silica sand.
3. Size: Fine, #30 mesh

**D. Pigmented Sealer:**

1. Model: SSDT-100.
2. Type: Water based pigmented acrylic coating.
3. Color:
  - a. Custom color to match ICI Paints 9200 (The Home Depot Orange).
  - b. For projects to comply with CCR, use standard Yellow

**E. Clear Finish Sealer:**

1. Model: SSTD-1250.
2. Type: Water based clear acrylic coating.

**PART 3 - EXECUTION****3.01 INSTALLERS**

- A. Installers shall be certified by manufacturer.

**3.02 EXAMINATION**

- A. Substrates must be structurally sound and meet ADAAG and CCR (where applicable) requirements regarding configuration and slope.
- B. Notify Architect immediately if substrates are not acceptable. Do not install tactile warning surfacing until substrate meets requirements.

**3.03 PREPARATION**

- A. Asphalt Substrates: It is not necessary to remove and replace asphalt with Portland cement concrete; specified system may be installed directly on asphalt substrates that are in good condition.
- B. Repair damaged substrate surfaces.
- C. Pressure wash substrate and both sides of mat.
- D. Substrate and mat shall be dry and free of oil, grease, curing agents, dirt, dust, and other foreign material that may prevent proper adhesion.
- E. Layout:

1. Mark location to receive tactile warning surfacing with chalk or tape.
2. Layout mats so row of domes are aligned from mat to mat and perpendicular to direction of anticipated pedestrian traffic.
3. Remove truncated domes where full domes are not practical; do not use partial domes.
4. Trim mats so they do not cover expansion joints in substrate.
5. Install masking tape border 1/4 inch outside of mats.

**3.04 INSTALLATION**

- A. To extent practical and consistent with good practice, do not locate joints in substrate under tactile warning surfacing. Do not install joint sealers in substrate until installation of tactile warning surfacing is complete.
- B. Primer: Apply adhesive to substrate with 1/4 inch nap roller. Allow to dry to the touch.
- C. Adhesive: Apply adhesive with 3/16 inch notched trowel.
- D. Mats: Install mats into fresh adhesive. Use push broom to flatten mats and insure positive bond.
- E. Mat Perimeter and Seams: Brush or float with additional adhesives to hide seams. Do not allow adhesive to dry on masking tape.
- F. Base Coat: Allow adhesive used to install mats to dry to touch. Then, apply adhesive over top of mat using 3/4" nap roller.
- G. Sand: Broadcast evenly onto wet base coat to refusal. Allow base coat to dry to touch. Then blow-off un-bonded sand.
- H. Pigmented Sealer: Apply evenly using a 3/4" nap roller. Let dry to touch, then remove masking tape.
- I. Clear Finish Sealer. Apply evenly with garden sprayer or roller. Allow to dry to touch, then apply second coat.

**3.05 PROTECTION**

- A. Protect tactile warning surfacing against rain, freezing, and vehicular and heavy foot traffic until clear finish sealer had dried for eight (8) hours.
- B. Protect installed tactile warning surfacing against damage by subsequent construction activities.

**END OF SECTION**

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**Construction Specification**

Section 09790  
**FLOOR STRIPING**

**PART 1 - GENERAL****1. 01 SCOPE OF WORK**

- A. The Contractor shall provide all labor, material, appliances, and accessories necessary to complete the work. This section includes the following.

1. Application of floor striping tape

**1.02 RELATED WORK**

- A. Section 03360 - Special Concrete Floor Finishes

**1.07 PROJECT CONDITIONS**

- A. Close areas to traffic during floor application and after application, for time period recommended in writing by manufacturer.

**PART 2 - PRODUCTS****2.01 MATERIALS AND MANUFACTURERS**

- A. Lane Marking Safety Tape
1. Products
- a. Safety-Walk 600 Series Slip-resistant tape as manufactured by 3M.  
Color: Yellow (#630)
2. Locations
- a. General floor marking for pedestrian, forklift traffic, and clear floor space areas as indicated on drawings.

**PART 3 - EXECUTION****3.01 SURFACE CONDITIONS:**

- A. Prior to application, verify that floor surfaces are free of construction latent.

**3.02 APPLICATION**

- A. Apply tape at widths, dimensions, and colors as specified in construction drawings and per tape manufacturers' written instructions.

**3.03 WORKMANSHIP AND CLEANING**

- A. The premises shall be kept clean and free of debris at all times.
- C. Repair damages to surface caused by cleaning operations.
- D. Remove debris from jobsite
1. Dispose of materials in separate, closed containers in accordance with local regulations.

**3.05 PROTECTION**

- A. Protect finished work until fully cured in accordance with manufacturer's recommendations.

END OF SECTION



**PART 1 - GENERAL****1.01 SUMMARY**

- A. This section includes furnishing and installation of Clear Aliphatic Urethane Finish (Graffiti Resistant coating) to exterior walls where called out for on drawings.
- B. Related work specified elsewhere includes but may not be limited to:
  - 1. Section 03410: Prestressed/Precast Concrete Hollow Core Walls (if applicable)
  - 2. Section 03470: Tilt Up Panels (if applicable)
  - 3. Section 04230: Reinforced Unit Masonry (if applicable)
  - 4. Section 07180: Water Repellent
  - 5. Section 09836: Textured Surface Coating (if applicable)
  - 6. Section 09900: Painting (if applicable)

**1.02 QUALITY ASSURANCE**

- A. Manufacturers having products similar in function to the one named may request approval of their products for substitution. Approval must be requested 10 days prior to bidding.

**PART 2 - PRODUCTS****2.01 ACCEPTABLE PRODUCTS**

- A. Devote High Performance Coatings: Devthane 379, Clear Aliphatic Urethane Finish

**PART 3 - EXECUTION****3.01 INSPECTION**

- A. Installer shall examine the substrate to which the coating is to be applied. **Installer** to report any condition that is detrimental to the application and function of the coating to the Architect of Record prior to start of application.

**3.02 PREPARATION**

- A. Protect adjoining work, including sealant bond surfaces, from spillage or blow-over of coating. Cover adjoining surfaces where possible.
- B. Surfaces shall be sound, dry, and free of defects such as oil, grease, dirt, mildew, form release agents, curing compounds, laitance, and any other foreign substances. Verify that concrete surfaces have sufficient cure and moisture content is acceptable.
  - 1. Beginning of application means acceptance of substrate.

- C. When applying coating over painted surfaces, paint must be fully chemically cured prior to application of the coating.

**3.03 SCAFFOLDING**

- A. Provide scaffolding and use as necessary to insure all exposed surfaces are completely covered with coating.

**3.04 CONTRACTOR'S RESPONSIBILITY**

- A. Contractor shall be responsible to insure that ALL surfaces receiving subsequent finish or coatings are prepared in accordance with manufacturer's recommendations. Contractor and his subcontractors shall of the manufacturer inspect and approve the surface preparation prior to application of his product. Contractor shall advise Architect of Record immediately, in writing, of any incompatibilities between materials or surfaces. Commencement of application implies acceptance of the surface and shall constitute waiver by the respective contractor and general contractor to any claim of incompatibility.

**3.05 APPLICATION**

- A. Comply with manufacturer's recommendations for mixing of coating material. Devthane 379UVA is a two-component product supplied in 5 gallon or 1 gallon kits which contain the proper ration of ingredients. Refer to manufacturers specifications for complete mixing details.
- B. Add 2.0 ml per gallon of dissipating dye DC050A000 to the clear coat in the field before application.
- C. Apply coating material in accordance with the manufacturer's current technical data sheet for general information, application instructions and coverage rates.
- D. Coating material shall be applied in the following order:

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**Construction Specification**

Section 09860  
**GRAFFITI RESISTANT COATING**

First Coat – Tru-Glaze-WB 4030, Waterborne Epoxy Primer  
Second Coat – Devthane 378 UVA (378 KXXX), Aliphatic Urethane  
Third Coat – Devthane 379 UVA (379 K0036), Clear Aliphatic Urethane

- E. Dry film thickness shall be 2.0-3.0 mils.
- F. Apply coating only when moisture content of surfaces is within manufacturer's recommended limits.
- G. Devthane 379UVA shall not be applied over wet surfaces or under very humid conditions where condensation or fog could settle on the coating during curing process.
- H. Coating shall be applied by airless sprayer capable of 3,000 psi with .011" to .017" tip, or professional grade air sprayer with .070" or larger fluid tip. Adjust fluid and air pressure to produce a good spray pattern.
- I. Comply with manufacturer's recommendations for drying time between coats.
- J. Finish coats shall be smooth, free of streaks, laps or pile-up of coating, skipped or missed areas.
- K. Make edges of coating adjoining other materials or colors clean and sharp without overlapping.

END OF SECTION

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**Construction Specification**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Work described in this section includes:
1. Touching up of shop applied prime coats.
  2. Preparation of surfaces to receive finish.
  3. Priming and back-priming of millwork.
  4. Painting or finishing of surfaces as specified herein.
  5. Textured surface coating on exterior concrete wall surfaces
- B. Related Work specified elsewhere includes but not limited to:
1. Section 01010 - Preferred Purchasing
  2. Section 01012 - Preferred Purchasing
  3. Section 01411 - Testing and Inspection

**1.02 FBO PROCEDURES**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section. General requirements related to the Furnished by Owner (FBO) items are defined in Section 01010 unless noted otherwise by this section. All FBO Forms listed below are included as part of Section 01010 EXCEPT for the "Paint Form A: Paint Order Sheet", which is attached to this section.
- B. FBO Paint Vendor Contact:
- REHR / BEHRPRO / KILZ**  
Kyle Corder  
National Account FBO Manager – Behr Paints  
Phone: m (224) 227-4707  
Email: [KECorder@BehrPaint.com](mailto:KECorder@BehrPaint.com)
- C. Take-Offs: FBO Paint Vendor shall indicate paint quantities to be provided by the FBO Paint Vendor under the "Paint Form A: Paint Order Sheet". The General Contractor shall then provide his "take-off" using the "Paint Form A: Paint Order Sheet" and indicate any variance between that and the FBO Vendor Quantity Provided. (Note: "FBO Form B: Take-Off Confirmation Sheet" does not apply to this section.) The General Contractor shall send a completed "FBO Form A: Contractor Information Form" to the FBO Paint Vendor indicated above eight (8) weeks prior to the scheduled installation of the specified system.
1. The paint quantities provided by the FBO Paint Vendor shall represent a portion of the paint material quantities (by paint type) required for the project. All remaining paint material required for the project shall be provided by the General Contractor. The General Contractor's bid shall include all remaining paint material required for the project, all painting labor required for the project, and all equipment required for all interior and exterior painting on the project. Any paint material required on the project, but not specifically listed on the "Paint Form A: Paint Order Sheet" shall be the responsibility of the General Contractor. All paint materials beyond those quantities listed on the "Paint Form A: Paint Order Sheet" shall be the responsibility of the General Contractor.
  2. Home Depot will issue a Purchase Order to the FBO Paint Vendor based on the FBO Vendor Quantity Provided shown on the "Paint Form A: Paint Order Sheet". The FBO Paint Vendor shall deliver the paint quantities shown on the "Paint Form A: Paint Order Sheet" to the project site. The delivery date(s) of the paint material shall be coordinated in writing between the General Contractor and the FBO Paint Vendor. The FBO Paint Vendor will provide the paint material, mixed, labeled and ready for placement.
  3. In the event that a Change Order is approved by the owner for the scope of work that includes additional painting, the additional material required for the change order will be provided by the General Contractor.
- D. Receipt of Shipment: General Contractor shall verify shipment per the requirements of Section 01010 and complete the "FBP Form C: Confirmation of Shipment" and submit back to the FBO Vendor.
1. Damaged or missing material:
    - a. In the event the material delivered does not match the information provided in the Bills of Lading and Packing, the General Contractor will contact the FBO Paint Vendor Representative and The Home Depot Project Manager. Any missing material shall be documented on the Bill of Lading and signed by the FBO Paint Vendor's Delivery Driver only as an acknowledgement of the discrepancy. All information is to be sent directly to the FBO Paint Vendor Account Representative within 48 hours of the delivery.
    - b. Any visible damage to the paint material is to be recorded by photograph, documented on the Bill of Lading and signed for the FBO Paint Vendor's Delivery Driver as an acknowledgement of seeing the damage only. All information is to be sent directly to the FBO Paint Vendor Account Representative within 48 hours of the delivery. The General Contractor is then responsible to file the appropriate claims forms with the FBO Paint Vendor. The FBO Paint Vendor Representative will also file the respective claim and work directly with the General Contractor to resolve the issue. Unless these actions are taken by the General Contractor to

- document the claim, the referenced material and all products held on the Bill of Lading would become the full and unconditional responsibility of the General Contractor.
- c. By agreeing that the material shipped is accurate, any deficient quantity of material required is the responsibility of the General Contractor.
  - d. In the event that there is concealed damage, the General Contractor has up to ten (10) business days from the receipt of the shipped material to file a claim with the FBO Vendor Account Representative. The General Contractor must provide the Bills of Lading and packing list when submitting claims for damaged material.
- E. Request for Changes After Initial Shipment: No changes to the FBO Paint material shall be accepted, only corrections as indicated in Section 1.02D. All changes shall be the responsibility of the General Contractor.
- F. Return Merchandise Authorization Policy: The Home Depot will add to the General Contractor's scope of work the responsibility for coordinating one (1) customer accommodation return request through the FBO Paint Vendor. Requests shall be submitted using the "FBO Form E: Returned Merchandise" as specified in Section 01010.
- 1. Returned material shall include unused paint which was supplied by the FBO Paint Vendor. Credit shall be issued by the FBO Paint Vendor to The Home Depot for this material.
  - 2. Unused paint purchased by the General Contractor shall be subject to the return policy of the General Contractor's point of purchase, but is not eligible for return to the FBO Paint Vendor.

### 1.03 PREFERRED PURCHASING

- A. For additional paint not supplied by the FBO Paint Vendor, General Contractor and all subcontractors are encouraged to purchase all products listed in the specification section through the FBO Paint Vendor or through the local Home Depot Store. For more information, refer to Section 01012.

### 1.04 REFERENCES:

- A. American Society for Testing and Materials Standards (ASTM):
- 1. ASTM D4258: Standard Practice for Cleaning Concrete.
  - 2. ASTM D4259: Standard Practice for Abrading Concrete.
  - 3. ASTM D4263: Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method
- B. Painting and Decorating Contractors of America.
- 1. "Painting and Decorating Craftsman's Manual and Textbook," latest edition

### 1.05 SUBMITTALS

- A. Product List:
- 1. Submit color samples to Architect of Record for "non-standard" colors only. All other "standard" and "approved" color submittals shall go to the general contractor. "Standard" and "approved" colors do not require color samples. "Standard" and "approved" colors are defined in Part 2 of this specification.
  - 2. Submit a complete list of products proposed for use at least 45 days prior to commencement of painting work.
  - 3. Use of products specified herein does not relieve contractor from responsibility of submitting product list.
- B. Product Data Sheets:
- 1. Submit manufacturer's Product Data Sheets outlining the practical square foot coverage per gallon, minimum specified dry film thickness, percent solids per volume and the number of gallons required to meet the specified dry film thickness.
- C. Certification:
- 1. Submit manufacturer's certified letter outlining the project square footage, minimum specified dry film thickness, percent solids per volume and the number of gallons required to meet the specified dry film thickness.

### 1.06 QUALITY CRITERIA

- A. Substitutions: none
- B. Materials furnished shall be installed providing the dry film thickness recommended by the manufacturer specifications.

### 1.07 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workman who are thoroughly trained and experienced in the necessary crafts, and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of

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**Construction Specification**

this Section.

- B. Comply with standards specified in this Section and these Specifications.
- C. The Owner will employ and pay for the services of an Independent Testing Contractor (ITC) to provide testing and inspections of the painting work.
- D. The services of the ITC, and the information provided by the ITC, are provided for the sole benefit of Owner. The information is provided to Contractor only so the Contractor is aware of what is being reported to Owner. The Contractor shall not, and is not entitled to, rely upon any information provided by the ITC in any manner. Contractor is solely responsible for assuring that the Work complies with the Contract Documents in all respects and may not rely on the ITC for this, or any other, assurance. The ITC and its representatives are not authorized to revoke, alter, relax, enlarge or release any requirements of the Contract Documents, approve or accept any portion of the Work, perform or excuse any duties of Contractor, or be a party to the scheduling of the Work. The ITC is not an authorized agent of the Owner with respect to the relationship between Owner and Contractor.
- E. Painting materials and operations shall be tested and inspected as the work progresses. Failure by the ITC to detect any defective work or material shall not in any way prevent later rejection (when such defect is discovered) nor shall it obligate the Owner for final acceptance.
- F. See Section 01411 Testing and Inspection for a complete description of the services to be performed by the ITC and additional Contractor responsibilities to facilitate that work.

**1.08 DELIVERY, STORAGE AND HANDLING**

- A. Storage, protection, and insurance for all products sent to job site are the responsibility of the General Contractor.
- B. Delivery:
  - 1. The FBO Paint Vendor shall deliver materials to job-site, ready-mixed in original containers with labels intact.
  - 2. The FBO Paint Vendor shall provide labels bearing manufacturer's name, paint type, color and recommended installation and reducing procedures.
  - 3. The General Contractor shall be responsible for unloading of the paint material at the project site.
  - 4. The General Contractor shall verify the paint quantities at the time of delivery, and will immediately advise The Home Depot and the FBO Paint Vendor of any discrepancies as indicated in Section 1.02 above.
- C. Storage and Handling:
  - 1. Store acceptable materials in a single place.
  - 2. Maintain neat, clean conditions in storage areas; remove rags and waste materials at end of each day's work.
  - 3. Close containers at end of day's work. Leave no hazardous materials open.

**1.09 JOB CONDITIONS**

- A. Environmental Requirements:
  - 1. Comply with manufacturer's specifications as to environmental conditions under which materials may be applied.
  - 2. Apply no materials in spaces where dust is being generated.
- B. Protection: Cover and protect finished work of other trades and surfaces not being painted concurrently or not to be painted.
  - 1. Mask off skylights (where applicable), nameplates, equipment identifications and similar items. Cover sprinkler heads with plastic bags and protect moving parts during painting. Remove all protective coverings at the completion of painting activity.
  - 2. Precautions must be taken to protect the "Orange Band" area indicated on drawings, from contamination from textured surface coating. This surface has to remain "bare" for specified paint system as indicated within.
- C. Safety Precautions:
  - 1. Provide temporary fire protection equipment in materials storage area.
  - 2. Prohibit smoking in storage area.

**1.10 CONTRACTOR'S RESPONSIBILITY**

- A. The contractor shall study the contract, drawings and specifications with regard to the work as shown and required under this Section as to insure its completeness.
- B. Contractor shall be responsible to insure that ALL surfaces receiving subsequent finish or coatings are prepared in accordance with manufacturer's recommendations. Contractor and his subcontractors shall require that a representative of the manufacturer inspect and approve the surface preparation prior to application of his product. Contractor shall

**Construction Specification**

immediately, give written notice of any incompatibilities between materials or surfaces. Commencement of Application implies acceptance of the surface and shall constitute waiver by the respective contractor and general contractor to any claim of incompatibility.

**1.11 WARRANTY**

- A. Warranty: Manufacturer shall provide a five (5) year warranty beginning from the date of Grand Opening and a final inspection by a Manufacturer's Representative, if required to validate warranty.
- B. The paint for the Orange Strip shall be guaranteed for seven (7) years. Prior to final closeout, the General Contractor must obtain a warranty kit (available from the paint manufacturer's Account Manager) and certify in writing that he has met the required paint specification.
- C. General Contractor is required to ensure any and all Subcontractors performing work covered under warranty are following the guidelines set forth by the paint manufacturer.
  - 1. General Contractor is responsible for ensuring the Warranty Process is followed as described in the documentation supplied to the General Contractor by the paint manufacturer's Account Manager. All forms and procedures must be followed in order to obtain warranty documentation from the paint manufacturer.
  - 2. Certification of warranty will be given to the General Contractor only if all conditions are met under the guidelines set forth in the Warranty Program of the documentation supplied to the General Contractor by the paint manufacturer's Account Manager.

**PART 2 - PRODUCTS**

**2.01 MATERIALS**

- A. Acceptable Paint Manufacturers:
  - 1. Behr, BehrPro and Kilz
- B. Where products other than those of the manufacturer listed as the standard of quality are specified in Paint Schedule, these products have been selected to achieve specific results and substitutions will not be allowed as specified under "Quality Criteria" above.
- C. Miscellaneous Materials:
  - 1. Paint Thinners and Tints shall be products of same manufacturer as paint or approved by him for use with his products.
  - 2. Shellac, turpentine and patching compound materials for execution of work shall be pure, best quality products.
- D. All products furnished in this section shall have a VOC content of 100g/L or less.

**2.02 COLORS**

- A. Paint colors shall be as indicated on the Drawings.
- B. Home Depot Orange will be factory mixed only as follows:
  - 1. Glidden Professional paint color Home Depot Orange 4216-9200 or 379-K9200/K0036.
- C. Manufacturer has specified color formulas for the colors indicated on the drawings and it is the responsibility of the Contractor to ensure the paint supplied matches the reference drawings in all respects to the paint manufacturer's colors. Contractors shall contact the manufacturer for further information prior to bidding.
- D. "Standard" Colors:

	<u>Behr Color</u>
1. "Home Depot Orange"	"HD Orange 2015"
2. "White on White"	"White" 1852
3. "Manilla Tan" – Light Tan	"Arabian Sands" 280-E-2
4. "Tantalizing Tan" – Dark Tan	"Burnt Almond" 280F-4
5. "Seal Grey" – Dark Gray	"Anonymous" 780F-5
6. "Black"	"Black Suede" S-H-790
7. "Veil" – Light Gray	"Porpoise" 790E-3
8. "Traffic Yellow"	OSHA Safety Yellow
9. "Red"	OSHA Safety Red
10. "Clamshell"	"Clamshell" 260E-2
11. "Linen White"	"Linen White" 1870
12. "Earth Tone"	"Earth Tone" 230F-6
13. White Dryfall	"White" PX89005

**Construction Specification**

- E. "Approved" colors (based on alternate color palettes – only when shown in drawings):

	<u>Behr Color</u>
1. "Afternoon Tea"	"Carmel Latte" 260F-7
2. "Timber Trail"	"Root Beer" 240F-7
3. "Antique Linen"	"Wild Honey" 760C-3
4. "Classic Ivory"	"Clair de Lune" 300E-3
5. "Sea Gull Grey"	"Garden Wall" 730D-4
6. "Grey Tweed"	"Mocha Accent" 720D-5
7. "Coastal Beige"	"Wild Porcini" 250E-3
8. "Sand Motif"	"Stone Brown" 250F-4
9. "Turret Brown"	"Traditional" 760B-6
10. "Cottage Chocolate"	"Revival Mahogany" 760B-7

**2.03 MIXING AND TINTING**

- A. Deliver paint products ready-mixed to job site.
- B. Paint shall be well ground, shall not settle, cake or thicken in the container, shall be broken with a paddle to a smooth consistency.

**PART 3 - EXECUTION**

**3.01 INSPECTION**

- A. Examine surfaces with representative of paint manufacturer, designated to receive work described in this section for conditions adversely affecting the finished work, which cannot be corrected under "preparation" requirements specified herein. Repair or replace surfaces not meeting tolerance or quality requirements imposed within specifications governing substrate construction prior to initiating this work.

**3.02 PREPARATION**

- A. Wood Surfaces:
- For Painted Surfaces: Fill all nail holes, cracks, joints and defects prior to first coat of paint. Match finish paint color.
  - For Natural or Stain Finish: Fill nail holes, cracks, joints, and defects with wood filler. Match finish color.
  - Sand surfaces even and smooth and dust or vacuum.
  - Clean soiled surfaces just prior to painting.
  - Apply shellac, not more than two pounds cut to knots, pitch and resinous sapwood before applying prime coat.
- C. Gypsum Drywall:
- Fill narrow, shallow cracks and small holes and drywall joint compound or patching plaster. Allow to dry.
  - Sand smooth without raising nap of paper on wallboard.
- D. Concrete Unit Masonry:
- Rub block to remove loose mortar.
  - Fill irregularities with cement grout. (No latence or efflorescence)
- E. Ferrous Metals:
- All unpainted surfaces shall be prepared in accordance with SSPC-SP 2 & 3, "Hand and Power Tool" cleaning.
  - All primed surfaces showing a gloss shall be sanded or brushed to a dull surface to provide a profile for mechanical bonding of succeeding coat.
  - Wash surfaces with non-ammoniated cleaner.
- F. Concrete:
- Pre-Surface Preparation:
    - New concrete should be allowed to cure a minimum of 28 days or meet the requirements of ASTM D4263. Surface laitance must be removed so as to expose aggregate.
  - Cleaning:
    - Concrete must free of grease, oils, coatings, dust, curing compounds and other contaminants in accordance with ASTM D4258.
    - Concrete shall be abrasively cleaned by an abrasive blast cleaning procedure in accordance with ASTM D4259, section 8
    - The surface profile is not to exceed 1/8" (peak to valley) or as required to maintain intended profile as specified in drawings. Minor surface area deterioration of 1/8" or greater shall be repaired to minimize excessive material usage. Preparation by mechanically abrading in accordance with ASTM 4259, section 6 is acceptable subject manufacturers approval.

- d. Edges and other areas inaccessible to the abrasive blast equipment should be prepared using a hand held surface scabbler with vacuum attachment.
    - e. For wet application, allow the surface to dry thoroughly for a minimum of 24 to 48 hours after rinsing prior to painting.
  - 3. Inspection:
    - a. After cleaning remove defective concrete, honeycombs, cavities, joint crack voids and other defects by routing to sound material. To repair small areas in concrete, use a suitable epoxy mortar. For larger areas, use cementitious patching materials which are compatible with the system. Patching should be finished flush with the surrounding concrete. All patched areas should be given a light brush blast prior to painting.
    - b. Verify the porosity of the concrete substrate using a pump-up sprayer and water. The water should uniformly soak into and darken the surface and not "bead up". Failure to do so is an indication that additional surface preparation is required.
    - c. Check using a pH pencil, check the pH of the concrete panels, as well as, concrete patches and sacking materials. pH level must be 10.0 or lower.
  - G. Galvanized Metal: Wash with non-ammoniated cleaner and wipe dry with clean cloth.
  - H. Aluminum: Wash with non-ammoniated cleaner and wipe dry with clean cloth.
  - I. Railings:
    - 1. After railing system has been assembled, all connections shall be ground smooth using SSPC-SP-3 power tool method.
  - J. Rooftop Gas Piping: SSPC-SP3 Power Tool Cleaning leaving a surface profile.
- 3.03 APPLICATION**
- A. Test surfaces with moisture meter prior to application of first paint coat. Apply paint only when moisture content is within manufacturer's recommended limits.
  - B. Apply paint materials using clean brushes, rollers or spraying equipment.
  - C. Apply materials at a rate not exceeding that recommended by paint manufacturer for surface being painted, less ten percent of losses.
  - D. Comply with manufacturer's recommendations for drying time between coats.
  - E. Vary slightly the color of successive coats.
  - F. Sand and dust between coats to remove defects visible from a distance of five feet.
  - G. Finish coats shall be smooth, free of brush marks, streaks, laps or pile-up of paint, skipped or missed areas.
  - H. Inspection:
    - 1. Do not apply additional coats until General Contractor has inspected completed coat.
    - 2. Only inspected coats of paint will be considered by determining number of coats applied.
  - I. Make edges of paint adjoining other materials or colors clean and sharp with no overlapping.
  - J. Where portion of finish is damaged or unacceptable, refinish entire surface of wall.
  - K. Backprime woodwork with material specified for prime coat, without runs on face.
  - L. Paint inside of ductwork flat black for entire area visible through duct openings.
  - M. Paint ductwork where visible.
  - N. Paint tops and bottoms of interior doors with prime coat only; paint edges same as faces of doors.
  - O. Finish all edges of exterior doors same as faces.
  - P. Paint exposed pipes conduit, electric boxes and ductwork in occupied areas same as adjacent wall or roof surfaces.
  - Q. Where bright colors are indicated on the plans apply additional coats of paint to cover the surface with a uniform coloring.
  - R. Spray paint the exposed underside of roof deck and/or Mezzanine and all structural and miscellaneous steel, steel joists and metal deck(s), etc. and all of the items and related equipment shown or scheduled on the drawings, unless specifically noted or scheduled to be unfinished. Touch-up surfaces which are damaged by other trades to the satisfaction of the Owner's Representative.



- S. The specified dry film thickness must be met. Apply additional coats as needed to achieve minimum total specified dry film thickness of the Paint System.
- T. Follow label instruction for application.
- U. Follow Product Data sheet / label requirements concerning application in cold weather environment. Special products or instructions may be required if air temperature is less than 50 degrees F (10 degrees C) at application.
- V. Surfaces shall be painted only when free from moisture. No painting on exterior surfaces shall be performed within 24 hours of forecasted rain, or during periods of dew or fog.
- W. Preparation and painting work shall conform to the recommended practices and quality standards of the "Painting and Decorating Craftsman's Manual and Textbook," latest edition, published by the Painting and Decorating Contractors of America.
- X. Do not apply texture to area designated to receive Orange Stripe.

### 3.04 CLEANING

- A. Touch up and restore finish where damaged.
- B. Remove spilled, splashed or splattered paint from all surfaces.
- C. Do not mar surface finish of item being cleaned.
- D. Leave storage space clean and in condition of equivalent space in project.

### 3.05 PAINTING SCHEDULE

- A. Surface not requiring painting or staining:
  - 1. Face brick, ceramic tile, glass, aluminum, brass, bronze, stainless steel, plastic, copper and rubber.
  - 2. Pre-finished surfaces, unless noted otherwise.
  - 3. Concealed ductwork, conduit and piping.
  - 4. Exposed galvanized ductwork and steel structure in membrane structure.
  - 5. Galvanized dry system sprinkler piping
  - 6. Overhead electrical track bussways
- B. Required total Dry Film Thickness (DFT): The DFT shall be the minimum required dry film thickness as measured in mils for each painting system on various substrates.
- C. Exterior Paint Systems (EPS): Provide the following paint systems for various substrates as indicated:
  - 1. **EPS-1: Ferrous Metals**
    - a. Typical Paint System Requirements:
 

i.	Primer: Kilz Complete Interior/Exterior Oil Base Primer (#L1012).	2.3 mils DFT
ii.	Intermediate: Behr Int/Ext Direct To Metal Semi-Gloss (#3200)	1.5 mils DFT
iii.	Topcoat: Behr Int/Ext Direct To Metal Semi-Gloss (#3200).	1.5 mils DFT
    - b. Where drawings indicate a Home Depot Orange Color/Finish on metals (or metal is exposed to direct sunlight), use a high performance, maximum weathering, corrosion, and U.V. resistant system as follows:
 

i.	Primer: Kilz Complete Interior/Exterior Oil Base Primer (#L1012)	2.3 mils DFT
ii.	Intermediate: Behr Int/Ext Direct To Metal Semi-Gloss (#3200)	1.5 mils DFT
iii.	Topcoat: Behr Int/Ext Direct To Metal Semi-Gloss (#3200).	1.5 mils DFT
  - 2. **EPS-2: Aluminum or Galvanized Steel (Waterborne Acrylic)**
    - a. Typical Paint System Requirements:
 

i.	Primer: Behr Premium Plus Multi Surface Int/Ext Primer/Sealer (#436)	2.0 mils DFT
ii.	Intermediate: Behr Int/Ext Direct To Metal Semi-Gloss (#3200)	1.5 mils DFT
iii.	Topcoat: Behr Int/Ext Direct To Metal Semi-Gloss (#3200).	1.5 mils DFT
  - 3. **EPS-3: Tilt-Up or Precast Concrete Panel Walls Textured Finish for front elevation walls only** (if applicable)
    - a. Typical Paint System Requirements:
 

i.	Primer: Behr Premium Plus Multi Surface Int/Ext Primer/Sealer (#436)	2.0 mils DFT
ii.	Intermediate: Behr Texture Coating (#4200)	7-10 mils DFT
iii.	Topcoat: Behr Pro e600 Exterior Latex Flat (#610)	1.5 mils DFT
  - 4. **EPS-4: Tilt-Up or Precast Concrete Panel Walls for rear and side walls only** (if applicable)

- a. Typical Paint System Requirements:
  - i. Primer: Behr Premium Plus Multi Surface Int/Ext Primer/Sealer (#436) 2.0 mils DFT
  - ii. Intermediate: Behr Pro e600 Exterior Latex Flat (#610) 1.5 mils DFT
  - iii. Topcoat: Behr Pro e600 Exterior Latex Flat (#610) 1.5 mils DFT
  
5. **EPS-5:** Tilt-Up or Precast Panel Walls **For front horizontal accent band only** (if applicable)
  - a. Where drawings indicate a Home Depot Orange Color/Finish, use a high performance, maximum weathering, corrosion, and U.V. resistant system as follows:
    - i. Primer: Behr Premium Plus Multi Surface Int/Ext Primer/Sealer (#436) 2.0 mils DFT
    - ii. Intermediate: Behr Marquee Exterior Semi Gloss (#5450) 1.5 mils DFT
    - iii. Topcoat: Behr Marquee Exterior Semi Gloss (#5450) 1.5 mils DFT

NOTE: PRIMER MUST BE APPLIED TO BARE CONCRETE.
  
6. **EPS-6:** Concrete Masonry Unit Exterior Walls (if applicable)
  - a. Typical Paint System Requirements:
    - i. Primer: Behr Premium Plus Multi Surface Int/Ext Primer/Sealer (#436) 2.0 mils DFT
    - ii. Intermediate: Behr Pro e600 Exterior Latex Flat (#610) 1.5 mils DFT
    - iii. Topcoat: Behr Pro e600 Exterior Latex Flat (#610) 1.5 mils DFT
  - b. Alternate for Weather-resistant system with texture:
    - i. Primer: Behr Premium Plus Multi Surface Int/Ext Primer/Sealer (#436) 2.0 mils DFT
    - ii. Intermediate: Behr Premium Elastomeric Smooth (#68) 10 mils DFT
    - iii. Topcoat: Behr Premium Elastomeric Smooth (#68) 10 mils DFT
  
7. **EPS-7:** Rooftop Gas Piping
  - a. Safety Yellow Paint:
    - i. Primer: Kilz Complete Interior/Exterior Oil Base Primer (#L1012) 2.3 mils DFT
    - ii. Intermediate: Behr Int/Ext Direct To Metal Semi-Gloss (#3200) 1.5 mils DFT
    - iii. Topcoat: Behr Int/Ext Direct To Metal Semi-Gloss (#3200). 1.5 mils DFT
  
8. **EPS-8:** Exterior Insulation and Finish System (EIFS)
  - a. Behr:
    - i. Primer: Behr Premium Plus Multi Surface Int/Ext Primer/Sealer (#436) 2.0 mils DFT
    - ii. Intermediate: Behr Premium Elastomeric Smooth (#68) 10 mils DFT
    - iii. Topcoat: Behr Pro e600 Exterior Latex Flat (#610) 1.5 mils DFT
  
- D. Interior Paint System (IPS): Provide following paint systems for various substrates as indicated:
  1. **IPS-1:** Concrete and Masonry (non-epoxy)
    - a. All White and Pastels:
      - i. Primer (at concrete only): Behr Premium Plus Multi Surface Int/Ext Primer/Sealer (#436) 2.0 mils DFT
      - ii. Primer (at masonry only): Behr Basement & Masonry Waterproofer (#875) 5.7 mils DFT
      - iii. Intermediate: Behr Premium Plus Interior Semi Gloss (#3050). 2.0 mils DFT
      - iv. Topcoat: Behr Premium Plus Interior Semi Gloss (#3050). 2.0 mils DFT
    - b. Home Depot Orange:
      - i. Primer: Behr Premium Plus Multi Surface Int/Ext Primer/Sealer (#436) 2.0 mils DFT
      - ii. Intermediate: Behr Marquee Exterior Semi Gloss (#5450) 1.5 mils DFT
      - iii. Topcoat: Behr Marquee Exterior Semi Gloss (#5450) 1.5 mils DFT
  2. **IPS-2:** Gypsum Drywall (Non-Epoxy)
    - a. Prime all new surfaces. Prime coat may be omitted on previously painted surfaces.
    - b. All White and Pastels:
      - i. Primer: Kilz Pro-X PVA Interior Primer(#10) 1.0 mils DFT
      - ii. Intermediate: Behr Premium Plus Interior Semi Gloss (#3050) 2.0 mils DFT
      - iii. Topcoat: Behr Premium Plus Interior Semi Gloss (#3050) 2.0 mils DFT
    - c. Home Depot Orange:
      - i. Primer: Kilz Pro-X PVA Interior Primer(#10) 1.0 mils DFT
      - ii. Intermediate: Behr Marquee Exterior Semi Gloss (#5450). 1.5 mils DFT
      - iii. Topcoat: Behr Marquee Exterior Semi Gloss (#5450). 1.5 mils DFT
  3. **IPS-3:** Ferrous Metal

- a. Typical Paint System Requirements:
  - i. Primer: Kilz Complete Interior/Exterior Oil Base Primer (#L1012) 2.3 mils DFT
  - ii. Intermediate: Behr Int/Ext Direct To Metal Semi-Gloss (#3200) 1.5 mils DFT
  - iii. Topcoat: Behr Int/Ext Direct To Metal Semi-Gloss (#3200) 1.5 mils DFT
  
- 4. **IPS-4:** Metal Roof Deck and Structural Steel Components (Dry Fall)  
System Coverage Requirements: 3.9 mils DFT
  - i. Primer: Kilz Complete Interior/Exterior Oil Base Primer (#L1012) 2.3 mils DFT
  - ii. One (1) coat: Behr Pro Dryfall Flat White (#890) 1.6 mils DFT
  
- 5. **IPS-5:** Painted Woodwork and Hardboard
  - a. Fire treated lumber sealer per Fire treated lumber supplier
  - b. White and Pastels:
    - i. Primer: Behr Premium Plus Multi Surface Int/Ext Primer/Sealer (#436) 2.0 mils DFT
    - ii. Intermediate: Behr Premium Plus Interior Semi Gloss (#3050) 2 mils DFT
    - iii. Topcoat: Behr Premium Plus Interior Semi Gloss (#3050) 2 mils DFT
  - c. Home Depot Orange:
    - i. Primer: Behr Premium Plus Multi Surface Int/Ext Primer/Sealer (#436) 2.0 mils DFT
    - ii. Intermediate: Behr Marquee Exterior Semi Gloss (#5450) 2.0 mils DFT
    - iii. Topcoat: Behr Marquee Exterior Semi Gloss (#5450) 2.0 mils DFT
  
- 6. **IPS-6:** Masonry (Epoxy)
  - a. Typical Paint System Requirements:
    - i. Primer: Behr Basement & Masonry Waterproofer (#875) 5.5-9.5 mils DFT
    - ii. Topcoat: Behr Int/Ext Alkyd Semi-Gloss Enamel (#3900) 1.6 mils DFT
  
- 7. **IPS-7:** Hand Railings (Interior and Exterior)
  - a. Typical Paint System Requirements:
    - i. Primer: Kilz Complete Interior/Exterior Oil Base Primer (#L1012) 2.3 mils DFT
    - ii. Intermediate: Behr Int/Ext Direct To Metal Semi-Gloss (#3200) 1.5 mils DFT
    - iii. Topcoat: Behr Int/Ext Direct To Metal Semi-Gloss (#3200) 1.5 mils DFT
  
- 1. **IPS-8:** Gypsum Drywall (Epoxy):
  - a. Typical Paint System Requirements:  
System Coverage Requirements: 4.2 mils DFT
    - a). Primer: Kilz Pro-X PVA Interior Primer(#10) 1.0 mils DFT
    - b). Intermediate: Behr Int/Ext Alkyd Semi-Gloss Enamel (#3900) 1.6 mils DFT
    - c). Topcoat: Behr Int/Ext Alkyd Semi-Gloss Enamel (#3900) 1.6 mils DFT

END OF SECTION



Furnished by Owner (FBO)  
Paint Order Sheet

Home Depot Address: \_\_\_\_\_  
Store #: \_\_\_\_\_  
HD Project Manager: \_\_\_\_\_

Vendor Providing Materials: Behr Process Corporation      Phone: (m) 224-227-4707  
Vendor Account Rep: Kyle Corder      Email: KECorder@BehrPaint.com

Contractor Name: \_\_\_\_\_ Phone: \_\_\_\_\_

Contractor Signature: \_\_\_\_\_ Date: \_\_\_\_\_

THIS FORM MUST BE RETURNED TO THE FBO VENDOR PRIOR TO SHIPMENT OF MATERIALS

The Contractor will purchase variance of material through:  
☐ FBO Paint Vendor  
☐ Local The Home Depot store

Item Description	Color	FBO Vendor Quantity Provided (gallons)	Contractor Take Off	Variance (Ordered by Contractor)
EXTERIOR PAINT SYSTEMS (EPS)				
EPS-1: Ferrous Metals				
Primer	"White"	150		
Intermediate	n/a			
Topcoat	"White 1852" P-2	200		
	"Dark Bronze" P-14	2		
EPS-1: Ferrous Metals (orange only)				
Primer	White	2		
Intermediate	"HD Orange 2015" P-1	2		
Topcoat	"HD Orange 2015" P-1	2		
EPS-2: Aluminum or Galvanized Steel				
Primer	Tinted	5		
Intermediate	"Arabian Sands" P-3	5		
Topcoat	"Arabian Sands" P-3	5		
EPS-3: Tilt-Up or Precast Concrete Panel Walls Textured Finish for front elevation walls only				
Primer	Included on EPS-4			
Intermediate	Texture "Arabian Sands" P-3X	200		
Topcoat	Flat "Arabian Sands" P-3	35		
	Flat "Burnt Almond" P-4	15		

Item Description	Color	FBO Vendor Quantity Provided (gallons)	Contractor Take Off	Variance (Ordered by Contractor)
<b>EPS-4: Tilt-Up or Precast Concrete Panel Walls for rear and side walls only</b>				
Primer	Tinted for all 4 elevations	220		
Intermediate	"Arabian Sands" P-3	90		
Topcoat	"Arabian Sands" P-3	90		
Intermediate	"Burnt Almond" P-4	25		
Topcoat	"Burnt Almond" P-4	25		
<b>EPS-5: Tilt-Up or Precast Concrete Panel Walls For front horizontal accent band only</b>				
Primer	Tinted	5		
Intermediate	"HD Orange 2015" P-1	10		
Topcoat	"HD Orange 2015" P-1	10		
<b>EPS-6: Concrete Masonry Unit Exterior Walls (if applicable)</b>				
Primer	n/a			
Intermediate	n/a			
Topcoat	"Arabian Sands" P-3			
<b>EPS-7: Rooftop Gas Piping</b>				
Primer	Tinted	2		
Intermediate	"OSHA Safety Yellow" P-8	2		
Topcoat	"OSHA Safety Yellow" P-8	2		
<b>EPS-8: Exterior Insulation and Finish System (EIFS)</b>				
Primer	Included on EPS-4			
Intermediate	"Arabian Sands" P-3	5		
Topcoat	"Arabian Sands" P-3	5		
Intermediate	"HD Orange 2015" P-1	2		
Topcoat	"HD Orange 2015" P-1	2		
<b>INTERIOR PAINT SYSTEMS (IPS)</b>				
<b>IPS-1: Concrete and Masonry (non-epoxy)</b>				
Primer	White	70		
Intermediate	"White 1852" P-2	70		
Topcoat	"White 1852" P-2	70		
<b>IPS-2: Gypsum Drywall (non-epoxy)</b>				
Primer	White	30		
Intermediate	n/a			
Topcoat	"White 1852" P-2	40		
	"Anonymous" P-5	40		
	"Porpoise" P-7			
	"Clean Canvas" P-10	5		
	"Linen White" P-11			
	"Earth Tone" P-12			

Item Description	Color	FBO Vendor Quantity Provided (gallons)	Contractor Take Off	Variance (Ordered by Contractor)
<b>IPS-3: Ferrous Metal</b>				
Primer	White	15		
Intermediate	n/a			
Topcoat	"White 1852" P-2	20		
	"Black" P-6	5		
	"OSHA Safety Red" P-9	5		
	"HD Orange 2015" P-1	2		
	"Linen White" P-11			
<b>IPS-4: Metal Roof Deck and Structural Steel Components (Dry Fall)</b>				
Primer	"White"	1600		
Topcoat	"White Dry Fall" P-13	1600		
<b>IPS-5: Painted Woodwork and Hardboard</b>				
Primer	"White"	5		
Intermediate	n/a			
Topcoat	"White 1852" P-2	5		
	"Anonymous" P-5			
<b>IPS-5: Painted Woodwork and Hardboard (orange)</b>				
Primer	n/a	-		
Intermediate	n/a	-		
Topcoat	"HD Orange 2015" P-1	-		
<b>IPS-6: Masonry (Epoxy)</b>				
Primer	n/a			
Intermediate	n/a			
Topcoat	"White 1852" P-2	4		
<b>IPS-7: Hand Railings (Interior and Exterior)</b>				
Primer	n/a			
Intermediate	n/a			
Topcoat	"White 1852" P-2			
<b>IPS-7: Gypsum Drywall (Epoxy)</b>				
Primer	n/a			
Intermediate	n/a			
Topcoat	"White 1852" P-2	4		

END OF SECTION

**PART 1 - GENERAL****1.01 SUMMARY**

- A. Work Included: All labor, materials, appliances, tools, equipment, facilities, transportation and services necessary for and incidental to performing all operations of the work of this section, complete as shown on drawings and as specified herein.
- B. Related work specified elsewhere includes but is not limited to:
  - 1. Section 01012 - Preferred Purchasing
  - 2. Section 06100 - Rough Carpentry
  - 3. Section 09260 - Gypsum Drywall

**1.02 PREFERRED PURCHASING**

- A. Unless noted otherwise, Contractor and all subcontractors are encouraged to purchase all products listed in this specification section from a local The Home Depot Store. For more information, refer to Section 01012.

**1.03 QUALITY CRITERIA**

- A. Qualification of Installers: For the actual cutting and installation of panels, use only thoroughly trained and experienced installers. In the acceptance or rejection of installed panels, no allowance shall be made for lack of skill on the part of installer.
- B. Warranty: All materials and workmanship shall be warranted against defects for a period of one (1) year from date of the Grand Opening.
- C. Substitution: Manufacturers having products of design, function and quality equivalent to those products in accordance with substitution provision of the General Conditions.

**1.04 JOB CONDITIONS**

- A. Use all means necessary to protect paneling materials before, during and after installation and to protect the installed work of other trades. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect of Record and at no additional cost to the Owner.

**PART 2 - PRODUCTS****2.01 PRODUCTS**

- A. Acceptable Manufacturer:
  - 1. Marlite
- B. Fiberglass Reinforced Panels (FRP):
  - 1. Size: 48" x 96" x 3/32" thick
  - 2. Type and Finish: Refer to drawings
  - 3. Color: Refer to drawings
- C. FRP Moldings
  - 1. Vinyl moldings: edge molding, inside corner molding, division molding, outside corner molding for 3/32" FRP paneling.
- D. Adhesives
  - 1. All adhesives shall be only those recommended by the manufacturer being installed.

**PART 3 - EXECUTION****3.01 EXAMINATION**

- A. Prior to all work of this Section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may begin. Verify that the final installation will be incomplete accordance with the original design and the manufacturer's recommended method of installation. In the event of discrepancy, immediately notify the Architect of Record and proceed as he directs.

- B. Building shall be closed in and dried out before installing panel.
- C. Ceiling and sidewalls should be "dried in" so that no moisture can run down, over or behind the panels.
- D. Interior building shall be above 60 degrees F. so that adhesive will work and set up properly.

### 3.02 PREPARATION OF SURFACES

- A. Drywall to be smooth with no low or high spots.
- B. All walls to be thoroughly dry.

### 3.03 INSTALLATION OF FRP PANELING

- A. Installation instructions that are included in every package of FRP Panels should be read on the job and followed in detail.
- B. Cutting: With fine tooth saw, with face side up, cut neatly around any pipes or boxes.
- C. Wall panels to fit against ceiling and on top of base or as shown on details. Cut neatly to fit.
- D. In using sheet materials (48" x 96" x 3/32" or similar size) apply over a solid backing using adhesive.
- E. Adhesive: Wall panels to be cemented to drywall with waterproof adhesive. Cover entire back of panels with adhesive as recommended by manufacturer.
- F. Molds to be used on external edges, external angles, integral angles and between sheets of panel. Use molds at all edges and allow 1/8" expansion room in each molding.

### 3.04 CLEANING

- A. Prior to final site review, clean all smudges or adhesives from face of panels and moldings as well as any adjacent surfaces. Remove all excess material.

END OF SECTION



**PART 1 - GENERAL****1.01 SUMMARY**

- A. Provide Overhead-Braced and Floor-Anchored, PolyLife (Solid High Density Polyethylene) Toilet Partitions and Floor-Anchored Privacy Screens as indicated on Drawings and as specified herein. Grab Bars provided under Toilet Accessories.
- B. Related Sections include the following:
  - 1. **Section 04230 – Reinforced Unit Masonry**
  - 2. Section 10810 - Toilet Accessories

**1.02 REFERENCES**

- A. American Society for Testing and Materials (ASTM).

**1.03 SUBMITTALS TO CONTRACTOR**

- A. Product Data; Submit manufacturer's detailed technical data for materials, fabrication, and installation, Including catalog cuts of anchors, hardware, fasteners, and accessories.
- B. Shop Drawings: For fabrication and installation of Toilet Partition and Screen assemblies. Include plans, Elevations, sections, details, and attachments to other work.
- C. Maintenance Instructions: Provide manufacturer's printed instructions for Maintenance of installed work.
- D. Written Warranty

**1.04 PROJECT CONDITIONS**

- A. Field Measurements: Verify dimensions in areas of installation by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the work.
- B. Established Dimensions: Where field measurements cannot be made without delaying the work, establish dimensions and proceed with fabricating units without field measurements. Coordinate supports, adjacent construction, and fixture locations to ensure actual dimensions correspond to Establish Dimensions.

**1.05 DELIVERY, STORAGE AND HANDLING**

- A. Deliver, store, and handle compartments as recommended by manufacturer to protect from damage.

**1.06 MANUFACTURER'S WARRANTY**

- A. Provide manufacturer's written warranty on its Panels, Pilasters and Doors for twenty five (25) years, against breakage, corrosion and delamination; to be replaced without charge, excluding labor.
- B. Provide manufacturer's written warranty on hardware for ten (10) years; to be replaced without charge, excluding labor.

**PART 2 - PRODUCTS****2.01 MANUFACTURER**

- A. Partition Systems Incorporated of South Carolina

**2.02 MATERIALS**

- A. General: Provide material which has been selected for surface flatness and smoothness. Exposed surfaces which exhibit pitting, seam marks, roller marks, stains, discolorations, telegraphing of core material, or other imperfections on finished units are not acceptable.
- B. Material shall be PolyLife (Solid High Density Polyethylene) and shall have homogenous color throughout entire thickness. PolyLife shall be waterproof, non-absorbent and shall have a self-lubricating surface to resist marks from pens, pencils and other writing instruments. Doors and Panels shall have a finished height of 55.0". An Aluminum Heat Sinc shall be provided on the bottom edge of all Doors and Panels. All edges shall have a .250" radius.
  - 1. Doors – Minimum 1.00" (25mm) Finished Thickness
  - 2. Divider Panels – Minimum 1.00" (25mm) Finished Thickness
  - 3. Pilasters – Minimum 1.00" (25mm) Finished Thickness

- C. Colors: As indicated on drawings
- D. Pilaster Shoes: ASTM A 167, Type 302/304 Stainless Steel, minimum 3" high, 18 gauge, finished with #3 Directional Polish, attached with Stainless Steel Through Bolts.
- E. Continuous Brackets: Full High (57.5") Extruded 6063-T5 Aluminum with a Satin Anodized finish. The minimum weight shall be 1.685 pounds per lineal foot. Inside of opening of Bracket shall be .50" for panels, .75" for pilasters. All holes for mounting to wall and panel/pilaster shall be pre-drilled. Holes are to be spaced 9" O.C. along the full length of the Bracket for a total fourteen (14) holes for mounting to the wall and seven (7) holes for mounting to the panel/pilaster. Each Bracket is to be packaged in a separate poly tube, and manufacturer.
- F. Hinge: 11 Gauge Cast Stainless Steel Hinge. Hinge shall be cast of Type 304 Stainless Steel and shall have a Satin Finish. Hinge shall be gravity type for self-closing action and shall be fully adjustable up to 360 degrees. Pivot pin shall be made of Type 304 Stainless Steel. Plastic inserts are unacceptable. Hinges shall be pre-drilled for mounting to door and pilaster with Stainless Steel Through-Bolts. Each Hinge is to be packaged in a separate carton, and is to be labeled by stock number, manufacturer, and left or right hand.
- G. Strike and Keeper: Heavy Duty 14 Gauge Stainless Steel and a Satin finish. The Strike and Keeper shall be 2.50" high, with mounting holes at 1.50" O.C. The Strike and Keeper shall be have an integral rubber bumper door stop. Each Strike and Keeper shall be packaged in a separate poly bag and is to be labeled by stock number and manufacturer. Furnish one per door.
- H. Slide Latch: Heavy Duty 14 Gauge Stainless Steel with a Satin finish. The Slide Latch shall be surface mounted. The slide bar shall be .830" wide and 2.250" long. Latch shall have an internal Stainless Steel buffering spring to prevent damage when door is inadvertently slammed against the Latch. Mounting holes are to be spaced at 1.90" O.C. Latch knob is to be riveted to the slide bar and then welded to insure that the knob will not come off. Each Slide Latch shall be packaged in a separate poly bag, and is to be labeled by stock number and manufacturer. Furnish one per door.
- I. Coat Hook: Heavy Duty Cast Stainless Steel with a Satin Finish. Coat Hook and Bumper shall be 2.340" high, 1.230" wide and shall protrude out from the door 3.05." The hook portion shall have a finished diameter of .250." The stock number shall be molded into the back of the Coat Hook and Bumper for ease in identification. Each Coat Hook and Bumper shall be packaged in a separate poly bag, and is to be labeled by stock number and manufacturer. Furnish one per door.
- J. Door Stop: Heavy Duty 14 Gauge Stainless Steel with a Satin Finish. Plated Zamac Door Stops are unacceptable. Door Stop shall have a 2.05" x 1.48" base and shall protrude 1.75" from the wall. The bumper at the end of the Door Stop shall be .250" thick. The diameter of the shaft shall be .270". Each Door Stop shall be packaged in a separate poly bag, and is to be labeled by stock number and manufacturer. Furnish one for each Disabled Accessible door.
- K. Pull handle: Heavy Duty 14 Gauge Stainless Steel with a Satin Finish. Plated Zamac Door Pulls are unacceptable. Pull handle shall protrude from the face of the door 1.07" and shall be 4.21" long. The Pull Handle shall have mounting holes drilled at 3.54" O.C. The Pull Handle shall be .655" wide. Each Pull Handle shall be packaged in a separate poly bag, and is to be labeled by stock number and manufacturer. Furnish one for each Disabled Accessible door.
- L. Overhead Bracing (Headrail): Continuous Heavy Duty Extruded 6063-T5 Aluminum Headrail with Anti-Grip profile. Headrail shall have integral reinforcing channel and curtain track. Headrail shall have a Satin Anodized finish. Provide Headrail Corner Brackets, Wall Brackets, and Headrail End Caps as required. The Headrail and Headrail Brackets shall have a minimum wall height of 2." The minimum wall thickness of the Headrail and Headrail Brackets shall be .125." Each Headrail Bracket is to be packaged in a separate poly bag, and is to be labeled by stock number and manufacturer.
- M. Anchorages and Fasteners: All Fasteners shall be Stainless Steel with theft proof heads, Through-Bolted unless noted otherwise. No chrome plated steel or brass will be acceptable.

## 2.03 FABRICATION

- A. General: Provide standard doors, panels, screens and pilasters fabricated for partition system, complete with all accessories and hardware listed above and as required for installation of fully functional system, unless otherwise noted. Provide units with cutouts and drilled holes to receive partition-mounted hardware, accessories and grab bars as indicated.
- B. Overhead-Braced and Floor-Anchored Partitions:
  - 1. Make provision for setting and securing continuous Extruded Aluminum Anti-Grip Headrail at top each pilaster.
  - 2. Furnish Plastic Shoe each pilaster to conceal supports and leveling mechanism.
- C. Doors: Unless otherwise indicated, provide 24" (610mm) wide in-swinging doors for standard Toilet Partitions and 36" (914 mm) wide out-swinging doors with a minimum 32" (813 mm) wide clear opening for Partitions indicated to be Handicapped Accessible.
- D. Floor Anchored Privacy Screens: Furnish Privacy Screens consisting of a pilaster and a panel of the same construction and finish as the Toilet Partitions. Furnish in accordance with the drawings.

**PART 3 - EXECUTION****3.01 INSTALLATION**

- A. General: Comply with manufacturer's written installation instructions. Install Partitions rigid, straight, plumb and level. Provide clearances of not more than .50" (13 mm) between pilasters and panels, and not more than 1.0" (25mm) between panels and walls. No evidence of drilling, cutting and patching shall be visible in finished work.
- B. Attach Continuous Wall Brackets to the wall with the following:
  - 1. At solid masonry: #14 X 1.50" long Stainless Steel Phillips Pan Head Screws and Plastics #14/16 Anchors at 9" O.C. vertical spacing.
  - 2. At cavity masonry: .25" diameter X required length Stainless Steel toggle bolts at 9" O.C. vertical spacing
- C. Overhead-Braced and Floor-Anchored Partitions: Secure pilasters to floor and level, plumb, and tighten. Secure continuous Headrail to each pilaster with not less than two (2) Through-Bolted Stainless Steel fasteners. Hang doors and adjust so tops of doors are parallel with overhead brace when doors are in closed position.
- D. Screens: Attach with anchoring devices according to manufacturer's written instructions and to suit supporting structure. Set units level and plumb and to resist lateral impact.

**3.02 ACCESSORIES**

- A. Mount accessories to Partition units in accordance with manufacturer's instructions.

**3.03 ADJUSTING AND CLEANING**

- A. Hardware Adjustment: Adjust and lubricate hardware according to manufacturer's written instructions for proper operation.
- B. Provide final protection and maintain conditions that ensure Toilet Partitions and Screens are without damage or deterioration at the time Substantial Completion.

END OF SECTION

**PART 1 – GENERAL****1.01 WORK INCLUDED**

- A. Comply with Divisions 0 and 1, and all documents referred to therein.
- B. This Section includes furnishing materials and installation of aluminum flagpoles and accessories to the extent indicated in **this** section and on the drawings.
- C. Related work specified elsewhere:
  - 1. Section 03410 - Pre-stressed Precast Concrete Wall Panels (if applicable)
  - 2. Section 03470 - Tilt-Up Panels (if applicable)
  - 3. Section 07901 - Joint Sealers/Fillers
  - 4. Section 16450 - Grounding
  - 5. Section 16500 - Lighting

**1.02 REFERENCES**

- A. ASTM B241 – Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube.

**1.03 DELIVERY, STORAGE AND HANDLING**

- A. Deliver and Handling
  - 1. Deliver materials to the project site with manufacturer's labels intact and legible.
  - 2. Spiral wrap flagpole with protective covering and pack in protective shipping tubes or containers.
  - 3. Protect flagpole and accessories on site from damage or moisture.

**1.04 DESIGN CRITERIA**

- A. Pole with Flag Flying: Supplier to provide engineering data to verify that the product will be capable of withstanding the local wind and seismic conditions of the installation.

**PART 2 – PRODUCTS****2.01 MANUFACTURER**

- A. Acceptable Manufacturers:
  - 1. **Acme Lingo Flagpoles**  
1865 Route 206  
Southampton, NJ  
Contact Chris Mazzela  
E-Mail: [chris@acmelingo.com](mailto:chris@acmelingo.com)  
Phone: 1-800-260-1897  
Fax: 1-609-801-1900

**2.02 FLAGPOLE AND ACCESSORIES**

- A. Flagpole: ASTM B241; 6063-T6 wrought alloy aluminum, cone tapered.
  - 1. Exposed Height: **as specified in drawings.**
  - 2. Nominal Wall Thickness: 3/8 inch (minimum) or greater as required to resist local wind speed.
- B. Finial Ball: Manufacturer's standard flush-seam ball, sized as indicated or, if not indicated, to match flagpole-butt diameter. Fabricate from 0.063-inch spun aluminum, finished to match flagpole.
- C. Truck Assembly: Cast aluminum; heavy duty external revolving; stainless steel ball-bearings, non-fouling.
- D. Cleats: 9 inch size, cast aluminum with stainless steel fastenings, one per halyard.
- E. **External** Halyard: 5/16 inch diameter white polyester braided, with two brass swivel snaps to secure the flag.

**2.03 GROUND MOUNTING COMPONENTS**

- A. Metal Foundation Tube: Manufacturer's standard corrugated-steel foundation tube, not less than 0.064-inch- nominal wall thickness. Provide with 3/16-inch steel bottom plate and support plate; 3/4-inch- diameter, steel ground spike; and steel centering wedges welded together. Galvanize steel after assembly. Provide loose hardwood wedges at top of foundation tube for plumbing pole. Provide flashing collar of same material and finish as flagpole.

- B. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107.
- C. Sand: ASTM C 33, fine aggregate.
- D. Elastomeric Joint Sealant: Joint sealant complying with requirements in Division 07 Section "Joint Sealants."
- E. Pole mounted lights: Refer to electrical drawings. Pole shall be factory prepared to accept light fixture. (Top dia. 3 1/2" for 40ft pole)

#### 2.04 WALL MOUNTING COMPONENTS (only when specified in drawings)

- A. Vertical Wall Mount Assembly mounted to back face of parapet
  - 1. Acme Lingo Model LHD-701 (Set of two), non-galvanized.
- B. Outrigger Wall Mount Assembly
  - 1. Acme Lingo Model B-12
- C. Exposed Vertical Wall Mount Assembly
  - 1. Acme/Lingo Model W-20

#### 2.05 FLAG

- A. 6 ft x 10 ft. heavy-duty polyester fabric. (or as specified in drawings)

### PART 3 – EXECUTION

#### 3.01 PREPARATION

- A. Coat metal surfaces in contact with dissimilar materials with asphaltic paint.

#### 3.02 INSTALLATION

- A. General: Install flagpoles where shown and according to manufacturer's written instructions.
- B. Ground Set: Place foundation tube, center, and brace to prevent displacement during concreting. Install flagpole, plumb, in foundation tube. Place tube seated on bottom plate between steel centering wedges and install hardwood wedges to secure flagpole in place. Place and compact sand in foundation tube and remove hardwood wedges. Seal top of foundation tube with a 2-inch layer of elastomeric joint sealant and cover with flashing collar.
- C. Base plate: Cast anchor bolts in concrete foundation. Install base plate on washers placed over leveling nuts on anchor bolts and adjust until flagpole is plumb. After flagpole is plumb, tighten retaining nuts and fill space under base plate solidly with non-shrink, nonmetallic grout. Finish exposed grout surfaces smooth and slope 45 degrees away from edges of base plate.
- D. Mounting Brackets and Bases: Anchor brackets and bases securely through to structural support with fasteners as indicated on Shop Drawings.
- E. Positive ground copper clad cable for flagpole installation.

#### 3.03 TOLERANCES

- A. Maximum Variation from Plumb: One inch.

#### 3.04 ADJUSTING AND CLEANING

- A. Clean surfaces.
- B. Adjust operating devices so that halyard and flag function smoothly.

END OF SECTION

**PART 1 - GENERAL****1.01 SUMMARY**

- A. The extent of chain link fences and gates as shown on the drawings.
  - 1. Standard and security fencing fabric
  - 2. Tubular and Square Framing
  - 3. Exterior and Interior Fencing
  - 4. Galvanized and vinyl coated
- B. Related work specified elsewhere includes, but may not be limited to:
  - 1. Section 01012: Preferred Purchasing
  - 2. Division 3 - Concrete
  - 3. Section 05501 - Metal Fabrications
  - 4. Section 08700 - Finish Hardware
  - 5. Section 09900 - Painting

**1.02 PREFERRED PURCHASING**

- A. Unless noted otherwise, Contractor and all subcontractors are encouraged to purchase all products listed in this specification section from a local The Home Depot Store. For more information, refer to Section 01012.

**1.03 QUALITY CRITERIA**

- A. Reference Standards: Comply with applicable provisions of the following published specifications and standards unless noted otherwise:
  - 1. ASTM A 90/A 90M-2001 - Weight of Coatings on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings.
  - 2. ASTM A 153-2000 - Specifications for Fire Coating (Hot-Dip) on Iron and Steel Hardware.
  - 3. ASTM A 392-1991b - Specifications for Zinc-Coated Steel Chain Link Fence Fabric.
  - 4. ASTM F 597-1998 - Standard Practice for Installation of Chain Link Fence.
  - 5. ASTM F 934-1996 - Standard Colors for Polymer-Coated Chain Link Fence Material.
  - 6. ASTM F 1043-2000 - Standard Specifications for Strength and Protective Coatings on metal Industrial Chain Link Framework.
- B. Provide chain link fences and gates as complete units controlled by a single source including necessary erection accessories, fittings and fastenings.

**1.04 DELIVERY, STORAGE AND HANDLING**

- A. Deliver materials to site in good condition, in original unopened packaging, and with labels intact. Inspect materials upon delivery and replace damaged or contaminated materials.
- B. Store materials above ground, undercover, in a dry place and in a manner to prevent damage or staining.
- C. Handle materials to prevent damage to surfaces, edges and ends. Replace damaged materials.

**1.05 GUARANTEE**

- A. Contractor shall guarantee entire installation for one year from date of the Grand Opening.

**1.06 SUBMITTALS TO CONTRACTOR**

- A. Product Data: Submit manufacturer's detailed technical data for materials, fabrication, and installation, including catalog cuts of anchors, hardware, fasteners, and accessories.
- B. Shop Drawings: For fabrication, location and installation of Chain Link Fencing and Gate assemblies. Include plans, elevations, sections, details, and attachments to other work.

**PART 2 - PRODUCTS****2.01 ACCEPTABLE MANUFACTURERS**

- A. Specified Manufacturer: Products of the following manufacturers are named in this Section to establish a standard of quality. All materials of each type used in the work shall be the product of a single manufacturer.
  - 1. Ameristar Fence Co.
  - 2. Boundry Fence and Railing Co.

**Construction Specification****CHAIN LINK FENCES AND GATES**

3. Master Halco
4. Merchants Metals, Inc.,

**2.02 STANDARD CHAIN LINK FENCING FABRIC**

- A. Fabric: No. 9 ga., class 2 galvanized, ASTM A 392 (2 oz. zinc per sq. ft.), or aluminum-coated, ASTM A 491 (.04 oz.), core size steel wires, 2" mesh, with top selvages knuckled for fabric 60" high and under, and both top and bottom selvages twisted and barbed for fabric over 60" high. Furnish one-piece fabric widths for fencing up to 12 ft. high and two-piece fabric widths for fencing up to 24 ft. high. Two piece widths shall be attached to central horizontal railing with fabric overlapping and wire tied at 15 " on center.
- B. Vinyl (PVC) Coating (when indicated on drawings): vinyl (PVC) coated over galvanized steel wire: ASTM F 668, Type 2B, 7 mil. thermally fused polyvinyl chloride as indicated on drawings. ASTM A 641, galvanized steel core wire, containing a minimum of 90% recycled steel. Tensile strength 75,000 psi. in core wire gages indicated below, with 0.30 oz./ft<sup>2</sup> zinc for 9 gage wire.
  1. Vinyl coating color shall be "Black" unless noted otherwise, on drawings.

**2.03 SECURITY CHAIN LINK FENCING FABRIC (MINI MESH)**

- A. Fabric: No. 11 ga., class 2 galvanized, ASTM A 392 (2 oz. zinc per sq. ft.), or aluminum-coated, ASTM A 491 (.04 oz.), core size steel wires, 3/8" mesh, with top selvages knuckled for fabric 60" high and under, and both top and bottom selvages twisted and barbed for fabric over 60" high. Furnish one-piece fabric widths for fencing up to 12 ft. high and two-piece fabric widths for fencing up to 24 ft. high. Two piece widths shall be attached to central horizontal railing with fabric overlapping and wire tied at 15 " on center. **Master Halco, Merchants Metals**
- C. Vinyl (PVC) Coating (when indicated on drawings): vinyl (PVC) coated over galvanized steel wire: ASTM F 668, Type 2B, 7 mil. thermally fused polyvinyl chloride as indicated on drawings. ASTM A 641, galvanized steel core wire, containing a minimum of 90% recycled steel. Tensile strength 75,000 psi. in core wire gages indicated below, with 0.30 oz./ft<sup>2</sup> zinc for 9 gage wire.
  1. Vinyl coating color shall be "Black" unless noted otherwise, on drawings.

**2.04 DIAMOND MESH (EXPANDED METAL):**

- A. Flattened Expanded Metal: **Ameristar - Matrix "X-Span"**
  1. Metal: Carbon Steel
  2. Style: 3/4" - #9F (flattened)
  3. Weight: 171 lbs. per 100 sq.ft.
  4. Thickness: .125 inches
  5. Sheet size: use largest sheet size practical for intended use
- B. Clean diamond mesh with a caustic solution meeting federal specifications then treat to prevent flush rusting.

**2.05 WIRE TIES**

- A. Tying chain link fabric:
  1. For tying fabric to line posts, use 9 gage wire ties spaced 12" o.c.
  2. For tying fabric to rails and braces, use 9 gage wire ties spaced 24" o.c.
  3. For tying fabric to tension wire, use hog rings spaced 24" o.c.
- B. Tying security chain link fabric:
  1. For tying fabric to line posts, rails and braces, use 3/16" diameter one-way self-drilling screws with rectangular washers spaced 24" o.c. Paint to match fence and posts.
  2. For tying fabric to tension wire, use hog rings spaced 24" o.c.
- C. Manufacturer's standard procedure will be accepted if of equal strength and durability.

**2.06 FENCE SLATS (if required - See drawings)**

- A. Manufacturer:
  1. Bunzle Extrusion. Phone: 1-800-755-7528 or approved equal
- B. Slat Style "W" for 2" mesh fabric, 9 gauge. Color to be selected from manufacturer's standard colors.

**2.07 TUBULAR FRAMING AND ACCESSORIES**

- A. Framework shall be tubular steel tubing as indicated in drawings, galvanized finish:

1. Type of post and rails required for each fence are as defined in the construction drawings.
2. The following shall be fabricated from steel containing a minimum of 90% recycled steel:
  - a. Galvanized Steel Tubular sections in accordance with ASTM F1043 and ASTM A-500,  $F_y = 46$  KSI or
  - b. Galvanized Steel Tubular sections in accordance with ASTM F1043 and ASTM A-500,  $F_y = 46$  KSI or Galvanized Steel Pipe in accordance with ASTM F 1083, Table 1 (Schedule 40), or ASTM A 53, with not less than 1.8 ounce of zinc per square foot of surface. Fence foundations, rails, end, corner, pull and line posts shall meet all applicable local wind conditions and codes.
- B. End, corner, pull and line posts: Refer to tables on Architectural drawings for sizes and spacing required for type and height of fence per local wind speed.
- C. Post foundations: Refer to drawings.
- D. Posts Tops: Weather tight closure cap, one for each post. Furnish caps with openings for top rail.
- E. Stretcher Bars: One (1) piece length equal to full height of fabric, with minimum cross section of  $3/16" \times 3/4"$ . Provide one stretcher bar for each gate and end post and two for every corner and pull post, except where fabric is integrally woven into post.
- F. Stretcher Bar Bands: Space not over 15" o.c. to secure stretcher bars to end, corner, pull and gate posts.

## 2.08 SQUARE FRAMING AND ACCESSORIES

- A. Framework shall be square steel tubing as indicated in drawings, shop primed for field painting per the Painting Specification Section.
  1. Accessories shall be shop fabricated as much as practicable, including but not limited to hinges, latches, stops, rails, kick plates, post base plates, hardware mounting plates, etc. Grind all welds prior to priming.
  2. Finish coats shall be as indicated in the "Exterior Aluminum or Galvanized Steel" part of the painting specification. Note: Field Primer is not required for Factory Primed items.
  3. Color shall be as indicated on the drawings.
- B. Fence Foundations, Rails, End, Corner, Pull and Line Posts shall meet all applicable local wind conditions and codes.
- C. End, Corner, Pull and Line Posts: Refer to Tables on Architectural drawings for sizes and spacing required for type and height of fence per local wind speed.
- D. Post Foundations: Refer to drawings.
- E. Bolts:  $3/16"$  diameter self-drilling hex head TEK screws, with flat washers, as manufactured by Hilti, Red-Head, or approved equivalent.
- F. Tension Rods: Provide stainless steel tension rods in standard lengths to equal full height of fabric, with maximum cross section to suit fabric openings. Provide one tension rod for each gate post, end post, corner post, and pull post.
- G. Truss Rods: Minimum  $3/8"$  diameter threaded steel rod and turnbuckle, galvanized.

## 2.09 GATES

- A. Fabricate swing gate perimeter frames from round or square tubes of size indicated on drawings. Metal and finish to match framework of fencing. Provide horizontals and attachment of fabric, hardware and accessories. Space so that frame members are not more than 8 foot apart. Tolerance between gate frame and opening shall not exceed  $1/2"$  maximum.

- 2.10 Assemble gate frames by welding or with special fittings and rivets for rigid connections. Use same fabric for standard gates as for fence unless otherwise indicated. Install fabric with stretcher bars at vertical edges. Bars may also be used at top and bottom edges. Attach stretchers to gate frame at not more than 15" o.c. Attach hardware to provide security against removal or breakage. Install diagonal cross-bracing in gate leafs  $4'-0"$  and wider consisting of  $3/8"$  diameter adjustable length truss rods on gates to ensure frame rigidity without sag or twist.

## 2.11 TUBULAR GATE HARDWARE AND ACCESSORIES

- A. Hardware shall be of certified malleable iron, galvanized per ASTM A 153.
- B. Standard Gate Hardware - Provide the following hardware and accessories for each gate:
  1. Hinges: Size and material to suit gate size, non-liftoff type, offset to permit 180 degree opening.
    - a. Gate leaves less than  $5'-0"$  wide and less than  $10'-0"$  tall shall have three hinges.
  2. Latch: Forked type with full height of gate plunger-bar type to permit operation from either side of gate with padlock eye as integral part of latch.
    - a. Gates up to and including  $12'-0"$  tall shall have 2 latch forks equally spaced.
    - b. Gates above  $12'-0"$  up to  $20'-0"$  tall shall have 3 latch forks equally spaced.



- C. Double Service Gate Hardware - Provide the following hardware and accessories for each gate:
  - 1. Provide manufacturer's stops for each leaf of double gates, consisting of a 2" I.D. x 6" long pipe sleeve cast into slab at both the closed and fully opened positions. Set in concrete to engage drop rod or plunger bar. Include locking device and padlock eyes as integral part of latch, using one padlock both gate leaves.
- D. Emergency man gates - Provide the following hardware and accessories for each gate:
  - 1. Hinges: Size and material to suit gate size, non-liftoff type, offset to permit 180 degree gate opening. Provide one pair of standard hinges and one pair of spring closer hinges for each leaf.
    - a. Gate leaves less than 5'-0" wide and less than 10'-0" tall shall have three hinges.
  - 2. Latch: Exit control lock and cylinder as specified in Section 08700 Finish Hardware.
  - 3. Latch Rail: Steel plate 1/8" x gate width bent 6" x 1'-4" x 6", weld to stiles at interior side of gate to receive and protect latch.
  - 4. Astragal: Steel plate 6" x 1/8" x gate height, weld to strike stile at exterior side of gate to protect latch.
  - 5. Kick Plate: Steel plate 10" x 1/8" x gate width, weld to stiles and bottom rail at interior side of gate.
  - 6. Strike Plate: Steel plate 2" x 1/8" x 6" long, weld to strike post for mounting lock strike.
- E. For remainder of gate hardware supplied by others, see drawings.

## 2.12 SQUARE GATE HARDWARE AND ACCESSORIES

- A. Hardware shall be of certified malleable iron, galvanized per ASTM A 153.
- B. Double Service Gate Hardware - Provide the following hardware and accessories for each gate:
  - 1. Hinges: Provide hinges of size and material to suit gate size, non-liftoff type, offset to permit 180 degree gate opening.
    - a. Gate leaves less than 5'-0" wide and less than 10'-0" tall shall have three hinges.
    - b. Gate leaves 5'-0" wide or more or 10'-0" tall or more shall have four hinges.
  - 2. Stops: Provide manufacturer's stops for each leaf of double gates, consisting of a mushroom type flush plate with anchors at both the closed and fully open positions. Set in concrete to engage drop rod or plunger bar.
  - 3. Cane Bolts:
  - 4. Latch: Include locking device and padlock eyes as integral part of latch, using one padlock for locking both gate leaves. Padlock by others.
- C. Emergency Man Gate Hardware - Provide the following hardware and accessories for each gate:
  - 1. Hinges: Hager 1850 or Stanley 850 6"x6" for surface application, with spun tips, offset to permit 180 degree opening, primed for field painting.
    - a. Gate leaves less than 5'-0" wide and less than 10'-0" tall shall have three hinges.
  - 2. Kick Plate: Steel plate, weld to stiles and bottom rail at interior side of gate as indicated in drawings.
  - 3. Surface Mounted Strike: Steel plate, weld to strike stile of pair gate inactive leaf for mounting lock strike.
- D. For remainder of gate hardware supplied by others, see drawings.

## 2.13 FINISH

- A. Ornamental metal and Diamond with a caustic solution meeting federal specifications then treated to prevent flush rusting.
- B. Ornamental metal shall be shop primed with one coat of gray rust inhibiting metal primer and painted in accordance with Section 09900. All field welds shall be primed immediately after welding has been complete.

## PART 3 - EXECUTION

### 3.01 FABRICATION

- D. Refer to Section 05501 for requirements for shop fabrication and workmanship.

### 3.02 INSPECTION

- A. Prior to installation, examine surfaces designated to receive work described in this Section for conditions adversely affecting the finished work. Repair or replace surfaces not meeting tolerances or quality requirements governing substrate construction prior to initiating this work.
- B. Do not begin installation and erection before final grading is completed unless otherwise permitted.

### 3.03 INSTALLATION

- A. Install materials in accordance with accepted shop drawings and manufacturer's printed instructions.

- B. Excavation: Drill holes for posts in firm, undisturbed or compacted soil.
  - 1. Unless otherwise indicated, excavate hole depths approximately 6" lower than post bottom, with bottom of posts set not less than 48" below top of post foundation.
- C. Setting Posts: Center and align posts in holes 6" above bottom of excavation.
- D. Set end, corner and gate posts at the beginning and end of each continuous length of fencing, at abrupt changes in vertical or horizontal alignment, and where shown on drawings.
- E. Place concrete around posts and vibrate or tamp for consolidation. Check each post for vertical and top align and hold in position during placement and finishing operation.
- F. Top Rails: Run rail continuously through post caps, bending radius for curved runs. Provide expansion couplings as recommended by fencing manufacturer.
- G. Bottom Rails: Install in one (1) piece between posts and flush with post on fabric side using special offset fittings where necessary.
- H. Intermediate Rails: Provide intermediate rails where shown (5'-0" max.). Install in one piece between posts and flush with post on fabric side, using special offset fittings where necessary.
- I. Brace Assemblies: Install braces so posts are plumb when diagonal rod is under proper tension.
- J. Fabric:
  - 1. Clearances: Install fencing and gates with a maximum ½" clearance between the perimeter of the fabric and the framing, between the framing and adjacent construction, and between the perimeter of each gate leaf and surrounding construction. Close off gaps exceeding ½" at the direction of the Owner's representative.
  - 2. Pull fabric taut and tie to posts, rail and tension wires.
  - 3. Place chain link fabric on the outside of the area to be enclosed. Secure one end and apply sufficient tension to remove all slack before making attachment elsewhere. Tighten the fabric to provide a smooth uniform appearance, free from sag.
  - 4. Cut fabric by untwisting one picket and attach each span independently at all terminal posts. Install tension rods with bolts and washers at 15" O.C. Join rolls of fabric by weaving a single picket into the ends of the rolls to form a continuous mesh.
- K. Stretcher Bars: Thread through or clamp to fabric 4" o.c. and secure to posts with metal bands spaced 15" o.c.
- L. Tie Wires: Use U-shaped wire, conforming to diameter of pipe to which attached, clasping pipe and fabric firmly with ends twisted at least two (2) full turns. Bend wire to minimize hazard to people or clothing.
- M. Fasteners: Install nuts for tension bands and hardware bolts on side of fence opposite fabric side. Peen ends of bolts or threads to prevent removal of nuts.
- N. Mini Mesh Fabric: Install stretcher bars as indicated above or provide one way fasteners with washers secured to posts and rails. Fasteners shall be finished to match fence.
- O. Fence Slats: Install where shown in contract documents. Install per manufacturer's instructions.
- P. All fencing, mesh, frame and fasteners to be of same finish as adjoining materials. Isolate dissimilar materials by separating with bituminous paint, caulking tape or electrolysis corrosion control spray. Protect prefinished surfaces from damage or disfiguration.
- Q. Gates: Install gates plumb, level and secure for full operation without interference. Install ground-set items in concrete anchorage as recommended by fence manufacturer. Adjust hardware for smooth operation and lubricate where necessary.

### 3.04 CLEAN UP

- A. During the progress of the work, the premises shall be kept free of debris and waste. Upon completion, remove from the site and dispose of all debris and surplus materials in a lawful manner.
- B. At completion of work, touch up minor damage to adjacent construction and prefinished surfaces to the satisfaction of the Architect of Record. Replace materials damaged or stained during installation. Protect completed work until final acceptance by Owner.

END OF SECTION

**PART 1 - GENERAL****1.01 SUMMARY**

- A. Furnish all labor, materials, tools and equipment required for installation of toilet accessories and related items indicated on the drawings and herein specified.
- B. Related work specified elsewhere includes but is not limited to:

- 1. Section 01011 - Special Purchase Program
- 2. Section 10166 – Toilet Partitions

**1.02 QUALITY ASSURANCE**

- A. Substitutions: Manufacturers having products of type, function and quality equivalent to those named in the construction drawings may request acceptance in accordance with requirements of Division 1.

**PART 2 - PRODUCTS****2.01 MANUFACTURERS**

- A. Refer to construction documents for manufacturers and model numbers of all toilet accessories.

**PART 3 - EXECUTION****3.01 EXAMINATION**

- A. Examine surfaces to receive accessories and notify the Architect of Record in writing of conditions detrimental to the timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.

**3.02 INSTALLATION**

- A. Mount accessories in accordance with manufacturer's printed instructions.
- B. Paper Products and Dispensers will be shipped to the store two (2) weeks prior to turnover.
- C. The General Contractor shall install all Dispensers and shall be responsible for lost, damaged or missing dispensers.

**3.03 CLEANING**

- A. Prior to final acceptance remove all protective covering on all accessories, clean and remove all smudges and all fingerprints.

**END OF SECTION**

**PART 1 - GENERAL****1.01 SUMMARY**

- A. This section of the specification includes the provision of the following:
  - 1. Money safe
  - 2. Pneumatic tube system carrier safe
  - 3. Carrier safe chute
- B. The General Contractor is responsible for the installation of the Deposit safe. The Pneumatic Tube System Installer is responsible for the installation of the carrier safe.
- C. Related Work
  - 1. Section 01010 - Furnished By Owner Items (FBO)
  - 2. Section 14580 - Pneumatic Tube System

**1.02 GENERAL REQUIREMENTS**

- A. The requirements of the Contract Documents, including the General and Supplementary General Condition and Division 1 - General Requirements shall apply to the work of this section.
- B. The specified Home Depot Safe Supplier shall furnish all safe equipment. Any additional non-factory related devices, accessories and utilities for the support and operation of the safes shall be provided by the General Contractor and its Electrical Contractor.
- C. The General Contractor shall coordinate all work as provided for in this section with all other related sections and trades. The General Contractor shall contact and coordinate scheduling with the pneumatic tube supplier for installation.
- D. Changes to the safes or material quantities after receipt of Purchase Order by the Safe Supplier shall be coordinated by the Safe Supplier and Home Depot promptly upon receipt of revised plans. The Safe Supplier shall submit associated change in materials and additional labor costs to the Home Depot project manager for approval.
- E. The entire installation shall meet latest applicable ordinances, codes and regulations of the installation locale.
- F. The owner shall provide and pay for all necessary licenses and permits.

**1.03 FBO PROCEDURES**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section. General requirements related to Furnished by Owner (FBO) Items are as defined in Section 01010. All FBO Forms listed below are included as part of Section 01010.
- B. Vendor Contact: Contractor shall send a completed "FBO Form A: Contractor Information Form" to the FBO vendor indicated below, twelve (12) weeks prior to the scheduled installation of the specified system:
  - 1. Security Design Service LLC  
Contact: Jack Dahl  
Phone: (865) 622-7646  
Fax: (865) 381-0563  
E-mail: jackd@securitydesignservice.com
- C. Take-Offs: FBO Vendor shall provide "take-offs" to the Contractor as specified in Section 01010. The Contractor shall then verify this "take-off" using an "FBO Form B: Take Off Confirmation Sheet".
- D. Receipt of Shipment: Contractor shall verify shipment per the requirements of Section 01010 and complete the "FBO Form C: Confirmation of Shipment" and submit back to the FBO vendor.
- E. Request for Changes: Changes to materials and quantities after receipt of shipment shall be coordinated by the contractor with the FBO vendor per the requirements of Section 01010 using an "FBO Form D: Request For Additional/Replacement Materials".
- F. Return Merchandise Authorization Policy: The Home Depot will add to the contractors' scope of work the responsibility for coordinating (1) customer accommodation return request through the FBO Vendor. Requests shall be submitted using the "FBO Form E: Returned Materials" as specified in Section 01010.

**1.04 RESPONSIBILITIES**

- A. The General Contractor shall coordinate scheduling with the Pneumatic Tube Supplier for the installation of the pneumatic tube system to the carrier safe.
- B. Carrier Safe is to be furnished by Home Depot and installed by the pneumatic tube supplier as shown on the Drawings. Home Depot's Safe Supplier shall adapt its Safe to accommodate the pneumatic tube supplier's pneumatic tube system requirements.
- C. The General Contractor shall coordinate scheduling with the Burglar Alarm Installer for the installation of alarm contacts at the safes.
- D. The Safe Supplier shall provide system operation, testing, turnover, warranty, compliance and after-market service.
- E. Any additional equipment and materials not indicated on the Drawings and added by state or local codes or authorities shall be immediately reported to the Safe Supplier. The General Contractor will provide additional equipment and materials deemed necessary.
- F. The Pneumatic Tube Supplier shall install, terminate and test the pneumatic tube system until fully operational.
- G. Installation of the money safe shall be handled by a representative from the Safe Supplier.

**1.05 SUBMITTALS TO CONTRACTOR**

- A. Provide (1) one copy of an Owner's Operation and Maintenance Manual which shall contain operation, maintenance and repair instructions.

**1.06 QUALITY ASSURANCE**

- A. Manufacturer
  - 1. The equipment described in this section represents the function and type of materials required and herein specified. The equipment indicated in this section does not intend to be a complete list of all components required for an operational and approved system but only as guidelines. Additional equipment not herein specifically indicated but is a necessary part of an operational and approved system shall be provided as required.

**1.07 DELIVERY, STORAGE AND HANDLING**

- A. Equipment shall be shipped in appropriate shipping cartons, pallets, etc. as necessary.
- B. The General Contractor is responsible for receiving the equipment at the job site. If the General Contractor is not ready for installation as scheduled, the General Contractor shall be responsible for proper and safe off loading and storage of the safes.
- C. The General Contractor will provide access to an appropriate clean dry staging area as required in the building for material delivery, off loading and storage.

**1.08 SCHEDULING**

- A. (8) Weeks prior to Grand Opening all construction components that are to be furnished by General Contractor or others, need to be completed.
- B. Carrier safe needs to be on site prior to start of pneumatic tube system installation.

**1.09 WARRANTY**

- A. Guarantee all equipment and workmanship to be free from inherent mechanical or system defects for one (1) year from date of grand opening.
- B. For service or warranty calls:
  - 1. Security Design Service LLC  
Contact: Jack Dahl  
Phone: (865) 622-7646  
Fax: (865) 381-0563  
E-mail: jackd@securitydesignservice.com

The following information is required:

Store #  
Store Location  
Contact Person  
Phone #  
Problem Description  
Home Depot Work Order #

All warranty calls are at no charge.

## **PART 2 - PRODUCTS**

### **2.01 ACCEPTABLE MANUFACTURERS**

1. Security Design Service LLC (SDS)

### **2.02 MONEY SAFE**

- A. Door shall be left hand hinged

### **2.03 PNEUMATIC TUBE CARRIER SAFE**

- A. Safe shall accommodate the pneumatic tube supplier's pneumatic tube system requirements.
- B. Door shall be right hand hinged

### **2.04 CARRIER SAFE CHUTE**

- A. Safe Supplier shall provide a chute with a wall mounted cash drop door to the carrier safe.

## **PART 3 - EXECUTION**

### **3.01 PREPARATION**

- A. Prior to starting installation work, building conditions shall be inspected to verify that the safes and pneumatic tube system may be installed in accordance with shop drawings.
- B. The General Contractor shall coordinate the work in this Section with all related trades. Work and/or equipment provided in other Sections and related to the safes shall include, but not be limited to:
  1. Carrier Safe must be delivered damage free, prior to tube system installation start date.
  2. Personnel properly authorized by The Home Depot must be on-site to verify Station Locations.
  3. Personnel properly authorized by The Home Depot must be on-site for System Training upon installation completion.
  4. Personnel properly authorized by The Home Depot must be on-site for System Inspection and Sign-Off upon installation completion.
- C. The owner's representative shall be notified at once of any discrepancy and installation in the areas involved shall not be undertaken until action regarding discrepancies has been decided.

### **3.02 INSTALLATION**

- A. Safes shall be installed per the Safe Supplier's written instruction and/or recommendations.

### **3.03 CLEANING**

- A. The Contractor's installation personnel shall organize their work and maintain orderly/clean conditions relating to the installation.

### **3.04 INSPECTION**

- A. When the General Contractor presents the system to the Owner for test, both shall immediately appoint a representative to examine workmanship and material, and test the system for operation compliance to the specifications.
- B. A certificate will be presented to the owner's representative upon completion for verification the system is operational and complete.

- C. The Owner shall appoint a representative to accompany the General Contractor's representative during the tune-up test period. During this period, the manufacturer shall instruct the Owner's representative in the operation and maintenance of the system. The Owner's representative shall train all additional personnel in the operation of the system.

END OF SECTION

**Construction Specification****LOADING DOCK EQUIPMENT****PART 1 - GENERAL****1.01 SUMMARY**

- A. Extent of loading dock equipment is indicated on drawings and includes the following:

1. Dock leveler with integral bumpers
2. Prefabricated Pit Form
3. Dock seal
4. Metal Hood above seal
5. Dock safety system (red/green lights)

- B. Electrical Power to equipment specified in Division 16.

**1.02 SUBMITTALS TO CONTRACTOR**

- A. Dock Levelers:

1. Product Data: Submit manufacturer's product data, installation instructions and maintenance instructions for each type of loading dock equipment.
2. Shop Drawings: Submit shop drawings for each type of loading dock equipment, including details, unit dimensions, required clearances, anchorages and other data required for a complete installation.
  - a. Submit color samples for Door Seals with Shop Drawing submittal.
3. Maintenance Data: Submit manufacturer's maintenance and service data, including address and telephone number of nearest authorized service representative.
4. Certification letter from supplier that he has executed a truck test prior to owner's Fixture, Furniture, and Equipment date, indicating that the dock bumpers supplied are sufficient to prevent truck trailers from hitting the building.

- B. Safety signal: (electrical contractor to furnish the following):

1. Product Data: Submit manufacturer's product data, installation instructions and maintenance instructions for each type of loading dock equipment.
2. Maintenance Data: Submit manufacturer's maintenance and service data, including address and telephone number of nearest authorized service representative.

**1.03 QUALITY ASSURANCE**

- A. Single Source Responsibility: Obtain each type of loading dock equipment from a single manufacturer.
- B. Comply with requirements of local authorities having jurisdiction.
- C. Dock Leveler Standard: Comply with applicable requirements of ANSI MH 14.1, 1987 standards.

**PART 2 - PRODUCTS****2.01 DOCK LEVELER EQUIPMENT**

- A. Hydraulic Dock Levelers as manufactured by Poweramp: Furnish dock levelers as a self-contained unit that mounts in pit. One push button operation with full hydraulic functions.

- B. Manufacturer:

1. Systems Inc. – Poweramp  
Contact: Jeff Schulze, Systems Inc. National Accounts 1-800-643-5424

- C. Leveler design

1. Levelers shall be surrounded by a 4 sided metal pan including a cut out in the rear for electrical j-box and connections
2. Dock leveler shall be 6ft wide by 8ft long, 30,000lb capacity and be of Hydraulic operation using Hydraulic Cylinders upward operation and gravity for lowering the leveler unto the truck. Leveler shall be activated by a single push button, which activates the pump and motor raising the leveler to its highest point upon which hydraulic flow is diverted from the raising cylinder to the front lip cylinder to position the lip into the bed of the truck. After the lip is positioned into the bed of the truck, the lip cylinder recesses away from the lip storing safely under the lip.
3. Leveler Hydraulics to be all single acting cylinders running under low pressure from 200-325 psi. The Hydraulic raising cylinder shall be mounted in the center of the pit centered both front to back and side to side. The Hydraulic raising cylinder shall be mounted in the upright position so as to spread the sudden weight associated with a safety lock up over the entire surface of the board and pit. Hydraulic raise cylinders shall not be positioned at more than 39 degrees to the pit floor in the full below dock position. To 68 degrees in the fully raised position.
4. Dock leveler to be designed for a minimum gross moving live load of 13,000 lbs dynamic, 10 trucks per day, fork truck speeds of 5 miles per hour with a leveler grade of +/- 8% leveler to be constructed using structural steel deck supports.
5. Leveler deck to be a minimum of ¼" thick safety tread plate with a yield of not less than 55,000 lbs.
6. Dock leveler shall be designed with toe guards to protect the user over the entire operating range of the leveler



**Construction Specification****LOADING DOCK EQUIPMENT**

7. Leveler shall be designed with a box style construction including front and rear header plates welded directly to the deck structure providing increased support in these areas.
8. Leveler frame to include no less than (5) vertical rear uprights supporting the rear hinge area
9. Leveler to include rubber style weather seals
10. Leveler to include (2) 6"x20"x11" vertical style, steel-faced bumpers.
  - a. Leveler supplier will review grade details and provide proper combination of bumper projection and lip length to suit building conditions
11. Leveler to include integral Maintenance prop.
12. Leveler to include Clean Sweep® style frame as standard

**D. Hydraulics**

1. Leveler to run off a low-pressure Hydraulic system utilizing single acting style cylinders.
2. Leveler Motor and controls to be 115 volt single phase - 60 hertz, supplied from 30A circuit.
3. Leveler free fall protection is to be built into the levelers hoist cylinder in the form of a ball check valve inside of the hoist cylinder casing. (safety legs are not an acceptable form of safety and will not be allowed)
4. Leveler hydraulics to be mechanically controlled using the Fluid Logic style control. Leveler fluid control to be totally mechanical having the leveler reach its highest point and fluid being mechanically diverted from the levelers hoist (raise) cylinder to the lip cylinder, positioning the lip. (solenoid flow control or electrical flow control of any type is not acceptable)
5. Recessing lip cylinder is to be single acting – the hydraulic lip cylinder is to recess back away from the lip after the lip is positioned onto the truck.
6. Levelers to use only single acting ram style Hoist (raise) cylinder offering the lowest operating pressure, and the strongest, sturdiest cylinder design. Regenerative hydraulics will not be accepted.

**E. Leveler Lip**

1. Leveler lip length to be reviewed by Poweramp to provide the proper combination of leveler lip length and bumper Projection to suit building conditions
2. Leveler lip Hinge to be fully gusseted at the header adding additional support for the lip hinge.
3. Lip thickness to be no less than 5/8" continuous thickness in all areas, welded support plates are not allowed
4. Leveler lip to be positioned hydraulically using recessed type lip cylinder. (Mechanical lips are not acceptable)

**F. Accessories**

1. Wheel Chocks: leveler manufacturer to supply 8"x8"x8" laminated style standard wheel chocks (2 per door) with 12'-0" 3/16" proof coil zinc chain. Manufacturer to include an 8"x10" sign per door to read: "Caution, wheels must be chocked".

**G. Leveler Controls**

1. Single Push Button Operation Control Box furnished with leveler
  - a. Press button leveler Rises and lip extends
  - b. Release Button and leveler lowers into back of truck
2. All controls to be included in one combination control box for ease of operation
3. All controls and power will be through control box for single point power connection protected by a fused (time-delay) disconnect (furnished by owner).
4. Leveler operation will be interlocked with and supervised by control from dock safety system.

**H. Warranty**

1. Manufacturer to supply a (10) year structural (10) year hydraulic warranty 1 year electrical. No pro rated warranties will be accepted. Warranty to include parts and labor for time specified.

**2.02 DOCK SAFETY SYSTEM (RED/GREEN LIGHTS)****A. Manufacturer:**

1. Systems Inc. – Poweramp  
Contact: Jeff Schulze, Systems Inc. National Accounts 1-800-643-5424

**B. Safety Signal System**

1. Model No.: Dock Alert **AL**
  - a. Inside control panel which powers and controls Dock leveler, Interlocking to overhead door, inside and outside communication system
  - b. Exterior light panel red and green lights with safety sign.
  - c. Field proximity door sensor with bracket.
    - i. Interlocks leveler and lights to overhead door

**C. Safety Signal Controls**

1. Control Panel to include interlocked LED light Communication system
  - a. Inside panel to include green and red lights that correspond to opposing traffic style outside lights

**Construction Specification****LOADING DOCK EQUIPMENT**

- b. Lights and leveler to be interlocked to dock door position
  - i. Outside and inside lights change automatically based on door position based on signal input from sensor (when door is fully open, lights change and leveler will function)
  - ii. Leveler will not function unless door is fully open preventing damage to the overhead door by the dock leveler and forcing the operator to be sure the door is fully open to prevent hitting a partially lowered door with the fork truck mast unit to include Normal, Bypass, and off switch for special Light operation.
- 2. Both inside and outside lights to be LED style
- 3. Unit will include a fixed field proximity switch mounted to the door track to control operation
- 4. Combination control box controlling leveler, communication lights, interlocking must be provided. Separate control boxes for equipment will not be allowed.

**2.03 SWING ARM STYLE DOCK LIGHT**

- A. Manufacturer:
  - 1. Systems Inc. – Poweramp  
Contact: Jeff Schulze, Systems Inc. National Accounts 1-800-643-5424
- B. Dual Arm 115volt dock light
  - 1. 40" double strut
  - 2. Standard Flood style bulb included
  - 3. Standard 115 volt 3 prong plug end to be attached to Electrician supplied outlet at each dock

**2.04 DOCK SEALS AND HOOD**

- A. Manufacturer:
  - 13. Systems Inc. – Poweramp  
Contact: Jeff Schulze, Systems Inc. National Accounts 1-800-643-5424
- B. MODEL: Fairborn Series 1400
- C. APPLICATION: Each unit shall be designed to accommodate an opening size 9'-0" wide x 10'-0" high; having a 48" dock height; equipped with 6" projection dock bumpers; and a slight declined drive approach. Unit shall be designed to service vehicles ranging in height from 12'-6" to 13'-6".
- D. SIZE: Each unit shall consist of (2) two side pads and (1) one head curtain sized to accommodate the specific application; and having the following minimum dimensions: HEAD CURTAIN: 10'-4" wide x 10" projection x 24" vertical drop; having a 12" split with Velcro/pull rope assembly; and an 18" high x 2" thick foam face.
- E. SIDE PADS: 8" @ rear x 16" @ face x 10" projection x 10'-0" long.
- F. MATERIAL: The unit shall have a performance base cover with 4" exposure performance material pleats at each end of the head curtain. The entire face of each side pad shall be further reinforced with an additional layer of performance material. The inside 48" high, lower portion of each side pad that is exposed to the opening's width shall be further reinforced with an additional layer of performance material. Each side pad shall have a dual yellow and orange guide stripe 24" high from the bottom of the pad. Material shall have specifications that meet or exceed the following. Color: black.

**TEST METHOD FOR PERFORMANCE MATERIALS**PLEAT/REINFORCEMENTS

Tear Strength Per Lbs  
 Method 5134: 300 x 300  
 \*Abrasion Resistance  
 Cycles/Method 5306: 6000  
 Tensile Strength Per Lbs/  
 Method 5100: 1200 x 1200  
 Cold Resistance at -40°F/  
 Method 5874: Pass

BASE

Tear Strength Per Lbs  
 Method 5134: 165 x 165  
 Abrasion Resistance  
 Cycles/Method 5306: 1250  
 Tensile Strength Per Lbs/  
 Method 5100: 550 x 575  
 Cold Resistance at -40°F/  
 Method 5874: Pass

\*H-22 Wheel, 1000 Gram Load, End Point - First Exposure to Base Fabric. Above tests are to be in compliance with Federal Testing Standard 191.

- F. CONSTRUCTION: The foam dock seal with full width head curtain shall have a performance base fabric and be reinforced with superior performance material as described in Section "E Material". The performance material side pad cover shall enclose a polyurethane foam pad, which is to be chemically welded to a 2" thick (nominal), pressure treated wood frame, kiln dried before and after treating. The cover shall wrap behind the wood frame and be secured with electro galvanized steel staples for weather -tight construction. Adequate air exhausts and drain holes are to be provided in covers, and both shall be designed to prohibit moisture infiltration. Side pads shall include highly visible, dual yellow and orange guide stripes 24" high. Mounting hardware shall have a rust resistant coating. Standard unit shall consist of two side pads that mount vertically along both sides of the door opening. The head curtain shall be secured at the building face by the means of a pressure treated, kiln dried before and after

**Construction Specification****LOADING DOCK EQUIPMENT**

treating (KDAT), 2" x 4" wood head frame. The 2" x 4" wood frame shall be mounted over the top of the side pads with the head curtain tapering away to provide for adequate drainage. Unit shall include intermediate "Scotchply™" stays, a front tubular metal support and tension straps to keep head curtain taut.

The support tubing shall be held in place by a fabric sleeve sewn into the head curtain.

G. COMPONENT SPECIFICATIONS:

1. FOAM: Density: 1.30+ .05# Cu/Ft; Indentation Load Deflection (ILD); 22-26#; Tensile 12.0 P.S.I. minimum; Tear 1.50lbs/inch; Elongation 150% (breaking point); Recovery: 92-93% (compressed 90% and held 22 hours at 158oF) no brittleness; Military Spec T-713A (Mildew and fungus resistant); ASTN Spec C-177-45 (Insulation Factor).
2. LUMBER: S/P/F Select Structural, Grade #1 only, grading rules for Western Lumber, July 1st, 1974. Western Wood Products Association 3rd edition, Board of Review, American Lumber Standards; Framework: Dimensional lumber, pressure treated with water borne preservatives to comply with AWPBL-2, kiln dried before and after treating. (KDAT)
3. GUIDE STRIPE: 6" wide; 22 oz vinyl coated nylon; safety yellow and orange; top coated with urethane; shall be sewn 24" high from the bottom of each side pad.
4. GLUE: Synthetic elastomer based solvent adhesive; viscosity 270 CPS 2/20 @ 76oF; Solids: 22; Weight: 10.2 pounds/gallon; Flash Point: None (Non-Flammable).
5. THREAD: GB-207 Polyester (white); 3-Ply Cord; 2.150 yarn/lb.; 4.334 Density M/KGM; 34# breaking strength (15.42 KG) .0170" Diameter; Government Spec #VT285B, Size 3, Type II, Class I, Subclass A.
6. STAPLES: 1" Crown x 1" leg length x .0595" diameter flattened to .062 x .055 chisel point; low carbon steel, AISI 1006-1018 minimum tensile strength 120,000 P.S.I.; Galvanized Coated - .1 oz/ft 2 minimum (ASTM A641, Class 1); glue tip activated when pneumatically driven into wood.
7. GROMMETS: Heavy gauge, solid brass, Government Spec AN-230, MIL-G- 16491C & MS-20230; Inserted and spaced in cover to allow for proper air and moisture release.
8. SEWING TECHNIQUES: All sewing shall be performed by professional seamstresses utilizing the following techniques and procedures: 5-5 ½ stitches per inch, all independently locked; Proper and equal tension on needle and bobbin thread to consistently bury the knot keeping top and bottom stitch taut. Beginning and ending of all continuous stitch runs shall have a minimum of 4 and a maximum of 8 stitches per inch of back tacking.

H. Metal Hoods: Provide standard manufacturer's galvanized steel hood.

I. Fabricate dock seals to fit in accordance with field measurements and manufacturer's recommendations.

J. Ship dock seals according to manufacturer's standard procedure.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. General: Install each item of loading dock equipment in strict accordance with manufacturer's instructions.
- B. Delivery and installation of the prefabricated steel pit form shall be coordinated as soon as possible in order to provide adequate time in scheduling pit form for use in field.

3.02 OPERATION AND ADJUSTMENT

- A. Adjust and lubricate each operating item of loading dock equipment. Test each item and make necessary adjustments for proper operation.

END OF SECTION

**Construction Specification****BULLET RESISTANT PROTECTION****PART 1 - GENERAL****1.01 SUMMARY**

- A. Furnish and install bullet resistant protection as indicated on drawings and specified herein.
- B. Work described in this section includes:
  - 1. Package Receiver
  - 2. Bullet Resistant Service Window
  - 3. Bullet Resistant Fiberglass
  - 4. Forced Entry Security Glass (if applicable)
- C. Related work specified elsewhere includes but is not limited to:
  - 1. Section 05400 - Cold Formed Metal Framing
  - 2. Section 08800 - Glass and Glazing
  - 3. Section 09260 - Gypsum Drywall

**1.02 DELIVERY, STORAGE AND HANDLING**

- A. Deliver and Handling
  - 1. Deliver materials to the project site with manufacturer's labels intact and legible.
  - 2. Handle materials with care to prevent damage.
- B. Storage
  - 1. Store materials inside under cover, stack flat, off floor.

**1.03 JOB CONDITIONS**

- A. Environmental Requirements
  - 1. Ventilation: Use temporary air circulators in enclosed areas lacking natural ventilation.

**1.04 QUALITY CRITERIA**

- A. Qualification of Installers: For the actual cutting and installation of panels, use only thoroughly trained and experienced installers. In the acceptance or rejection of installed panels, no allowance shall be made for lack of skill on the part of installer.

**PART 2 - PRODUCTS****2.01 MANUFACTURER**

- A. All products supplied under this section must be manufactured by:

Armortex  
5926 Corridor Parkway, Schertz, TX 78154  
Phone: (800) 880-8306  
Fax: (210) 661-8308  
Attn: David Hatt, dhatt@armortex.com

No substitutions will be accepted

**2.02 PACKAGE RECEIVER**

- A. Model: SSPR121214
- B. Overall Dimensions: 12"W x 12"H x 14"D
- C. Fabricate to meet or exceed Underwriter's Laboratories Standard for Safety, Class III Super Power Small Arms (SPSA).
- D. Construction: The main body consisting of two sides, top and bottom shall be constructed of 12 gauge hot rolled steel. The threat side door shall consist of an exterior 16 gauge stainless steel panel, a core of bullet resistant fiberglass composite and an interior 16 gauge cold rolled face sheet. The safe side door shall consist of two 16 gauge cold rolled steel panels with a core of bullet resistant fiberglass composite.
- E. Finish: Prime painted steel finish. Exposed mechanism is satin nickel-plated.

**Construction Specification****BULLET RESISTANT PROTECTION**

- F. Ballistic Rating: Level III, U.L. 752/SPSA, N.I.J. 0108.01/III-A.
- G. Operation: Outside door is controlled with release lever from inside. When outer door is open, inner door cannot open. When inner door is open the outer door cannot open. The threat side doors has a spring loaded self actuating closer. The safe side door is latched with a spring loaded keyed paddle lock.

**2.03 BULLET RESISTANT SERVICE WINDOW**

- A. 2" bullet resistant glass constructed of multiple plies of glass and alternate plies of PVB interlayer or 1-1/4" bullet resistant glazing constructed of multiple piles of polycarbonate material.
- B. Bullet Resistant glass shall be listed for UL 752, Level III. Glass size as indicated on drawings.
- C. Bullet resisting steel frame reinforced to meet UL criteria. Frame corners notched and welded. Prime Painted.
- D. The frame should be of the split design with sides that telescope into each other permitting the installation into a finished opening.

**2.04 BULLET RESISTANT FIBERGLASS**

- A. Board: Mechanically injected woven roving ballistic grade fiberglass cloth with a thermoset polyester resin.
- B. Ballistic Rating: Level III, U.L. 752/SPSA, N.I.J. 0108.01/III-A

**2.05 FORCED ENTRY SECURITY GLASS (where applicable)**

- A. Forced Entry/Bullet resistant security glass: 9/16" thick, Type SG1, Class 1 (Clear), Quality q3, ASTM C1036 and C1048, UL972.
  - 1. Product to meet H.P. White TP .0500 Test Procedure
  - 2. Forced Entry Level 1
  - 3. Level A ballistics (modified)

**PART 3 - EXECUTION****3.01 INSPECTION**

- A. Installer shall examine the substrates and conditions under which the package passer is to be installed, and notify the Architect of Record in writing of conditions detrimental to the completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.
- B. Verify that openings are dimensionally within the allowable tolerances, plumb, level, clean, provide a solid anchoring surface and are in accordance with approved shop drawings.
- C. Examine surfaces designated to receive work described in this section for conditions adversely affecting the finished work. Repair or replace surfaces not meeting tolerances or quality requirements imposed within specifications governing substrate construction prior to initiating this work.

**3.02 INSTALLATION OF PACKAGE RECEIVER AND SERVICE WINDOW**

- A. Install Package Receiver and Bullet Resistant Service Window in accordance with approved shop drawings, using skilled tradesman.
- B. Plumb and align Package Receiver faces in a single plane for each wall plane and erect unit and materials square and true adequately anchored to maintain positions permanently.
- C. Adjust Package Receiver for proper operation after installation.
- D. Furnish and apply sealants at all joints and intersections and at opening perimeters. Wipe-off excess material and leave all exposed surfaces and joints clean and smooth.

**3.03 INSTALLATION OF FIBERGLASS**

- A. Use Bullet Resistant Fiberglass of maximum lengths to minimize joints.
- B. Provide 4 inch wide strip backing to provide for 2 inches of overlap in both directions to insure the integrity of the protection level listed.

**Construction Specification**

**BULLET RESISTANT PROTECTION**

- C. Install in accordance with the manufacturer's recommendations including method of mechanical attachment to metal studs.

3.04 ADJUSTING AND CLEANING

- A. After completion of Package Receiver installation, unit shall be inspected, put into working order and left clean, free of labels, dirt, etc.
- B. Clean all smudges or adhesives from face of panels as well as any adjacent surfaces. Remove all excess material.

END OF SECTION

**Construction Specification****(NIC) PORTABLE AND MOBILE BUILDINGS****PART 1 - GENERAL****1.01 SUMMERY**

- A. This section includes the furnishing and installation of prefabricated portable anodized aluminum building(s) where shown on the drawings.
- B. The owner shall supply and install the referenced products. The General Contractor is responsible for electrical supply and connection to the prefabricated building as shown in the construction drawings. The General Contractor is responsible for contacting the vendor for any coordination required between the Vendor and the General Contractor.
- C. Related work Specified Elsewhere.
  - 1. Electrical service supply and connection.
  - 2. Site/Foundation work.
  - 3. Unloading, placement, installation and anchoring.
  - 4. Plumbing and piping (when required).

**1.02 QUALITY ASSURANCE**

- A. Structures shall be the product of a manufacturer with a minimum of 35 years-documented experience in the design and fabrication of portable aluminum buildings.
- B. Prefabricated buildings by manufacturers other than the one approved shall submit sufficient data to enable approval to be given. As a minimum: Design drawings and /or calculations, applicable certifications, catalog information, and color samples showing equal range of variety.
- C. Electrical devices factory installed within the prefabricated building shall be UL listed.
- D. Adherence to applicable portions of state and local building codes is the responsibility of the owner. Building manufacturer shall not be responsible for permits, special engineering calculations, or architectural type drawings unless otherwise notified in writing 3-weeks prior to release of bid document.
- E. Design Loads: 50 PSF live load, 30 PSF wind load.

**1.03 REFERENCES**

- A. Upon request, the prefabricated building manufacturer shall provide the locations and owners of three (3) similar buildings that have been in service more than three (3) years. This will allow the architect/owner to inspect on site and obtain a statement from the owners on the quality of workmanship (fit and finish).

**1.04 SUBMITTALS TO CONTRACTOR**

- A. Upon award of order, manufacturer shall prepare and submit copies of shop drawings as required for each different building required for this project. Drawings shall include elevations, section, floor plan, electric schedule, service entrance locations, and anchor clip detail.
- B. Color charts illustrating available colors and patterns for specified finishes shall be submitted to owner for prompt selections.

**PART 2 - PRODUCTS****2.01 MANUFACTURER**

- A. Porta-King Building Systems  
4133 Shoreline Drive  
Earth City, MO 63045  
Ph. 1-800-284-5346  
Fax 1-314-291-2857.  
  
Duraluminum Building System

**2.02 PRODUCT CONSTRUCTION**

**Construction Specification****(NIC) PORTABLE AND MOBILE BUILDINGS**

- A. General
  - 1. Building to be of aluminum construction, with natural satin anodized aluminum exterior surfaces. All anodized aluminum surfaces to carry a five- (5) year warranty from surface deterioration caused by oxidation. Building height to be 86 9/16", or 88 1/8" including rimit exterior roof. Model number to be **Duraluminum** as manufactured by **Porta-King Building Systems**.
  - 2. Structural members to be extruded aluminum angles, channels, and tee sections of structural alloy 6063T6, anodized 204R1, with ribbed pattern exterior surfaces.
  - 3. Fasteners used to manufacture and assemble buildings to be corrosion-proof type and to permit on-site replacement of damaged components. Welded fabrication is not acceptable.
- B. Wall and Ceiling Panels
  - 1. Wall panels to be 5/8" high-impact resistant and expansion resistant insulating OSB. Wall panels shall carry a five- (5) year warranty from swelling due to moisture absorption. Ceiling panel to be 3/4" thick, high impact resistant, moisture resistant, and expansion resistant insulating OSB with white vinyl permanently laminated to interior side, and plastic protective sheet laminated to upside. Ceiling panel to carry a five- (5) year warranty from swelling due to moisture absorption.
  - 2. Provide R-10 wall and ceiling insulation.
- C. Finish
  - 1. Clear anodized aluminum, diamond embossed sheet permanently laminated to exterior side.
  - 2. Provide total exterior paint, one color.
- D. Floor Structure
  - 1. Concrete slab as specified elsewhere
- E. Doors
  - 1. Doors to be of anodized aluminum, 1 3/4" tubular construction and half-glazed. Bottom portion to include panel finish to match interior and exterior building walls.
  - 2. Sliding door to be ceiling suspended in overhead track assembly and shall be fully
  - 3. Weather-stripped weather-stripped. Sliding doors shall incorporate a maximum-security laminated hook bolt deadlock with removable cylinders.
- F. Windows and Glazing
  - 1. Windows shall have anodized aluminum frames and inserts and to be industrial quality with active window panel to slide horizontally on stainless steel, ball-bearing rollers (plastic rollers are not acceptable). Windows to include inside positive locking device. Exterior window sill height to be 38" (inside sill height 34" from finished floor).
  - 2. Windows to be glazed with clear tempered safety glass.
- G. Counter
  - 1. Furnish 22" deep, full-width steel counter, 14ga. galvanized steel, per plans, 32" a.f.f.
  - 2. Cash Drawer
- H. Electrical
  - 1. Electrical service to include single phase, 100 amp capacity load center, pre-wired in conduit, with one 230v circuit and four 115v circuit capacity – provide two spare circuits. All electric work shall be in compliance with the National Electrical Code. All electrical components shall bear the UL label.
  - 2. Furnish one 115v duplex outlet, and one 230v single outlet.
  - 3. Lights to be fluorescent type fixture with acrylic lens (tubes to be furnished by others).
  - 4. Include one HVAC unit (230v, **10,400c/11,600h BTU**).
  - 5. Include one heater unit (230v, 4000w).
- I. Exterior Roof
  - 1. Exterior waterproof roofs include ribbed anodized fascia trim, matching structural with integral, self-contained gutters. Provide a 3" overhang. Roof ships installed.

**PART 3 - EXECUTION****3.01 GENERAL**

- A. Install prefabricated buildings on a flat and level concrete pad in accordance with the manufacturer's placement drawings. Position units over the utility stub-ups; verify building is level and anchor (Anchors are supplied on site, by others. Comply with local codes).

**END OF SECTION**



**Construction Specification****(FBO) GARDEN CENTER FABRICATIONS****PART 1 - GENERAL****1.01 SUMMARY**

- A. This Section describes scope of work to be supplied and installed by the Garden Center Contractor including:
  - 1. Metal Garden Canopy
  - 2. Seasonal Shade Structure or Retractable Shade Screen Structure (as applicable)
  - 3. Rainshield
  - 4. Circulating Fans under Metal Garden Canopy (connections by Electrical Contractor)
- B. The requirements of the work are shown on the "G" drawings.
- C. Related work specified elsewhere includes but may not be limited to:
  - 1. Section 01010 - Furnished by Owner Items (FBO)
  - 2. Section 03390 - Slab on Ground
  - 3. Section 03600 - Non-Shrink Grout
  - 4. Section 05500 - Metal Fabrications
  - 5. Section 07600 - Flashing and Sheet Metal
  - 6. Section 09900 - Painting
  - 7. Supply and Installation of all garden center irrigation shall be per the requirements of Division 15.
  - 8. Supply and Installation of all HVAC equipment shall be per the requirements of Division 15.
  - 9. Supply and Installation of all lighting shall be per the requirements of Division 16.

**1.02 GENERAL**

- A. The Metal Garden Canopy and Seasonal Shade Structure and Rainshield coverings with required factory mounting hardware, and accessories, manufactured by ROUGH BROTHERS INC, shall be supplied and installed by the Owner. Installer shall be herein referred to as the Garden Center Contractor.
- B. Garden Center Contractor shall include in his price, all labor and equipment rental necessary to completely install the Metal Garden Canopy and Seasonal Shade Structure and Rainshield as indicated on the plans, and perform all warranty work required during the warranty period.
- C. Garden Center Contractor Division of Work:
  - 1. Structural System: Furnish and install the structural system for the Metal Garden Canopy and Seasonal Shade Structure and Rainshield as manufactured by Rough Brothers Inc.
  - 2. Roofing system: Furnish and install Metal and Fiberglass roof panels, Shade Screen fabric, and facade fabric structure.
  - 3. Miscellaneous:
    - a. Furnish and install metal flashing and polycarbonate closure panels
    - b. Furnish and install circulating fans located under Metal Garden Canopy. Connections to be by Electrical Contractor.
- D. The General Contractor shall review and coordinate all modifications in FBO Documents, or field changes that impact this scope of work.
- E. The General Contractor shall coordinate with the local inspectors as required for all field testing and permits, that relate to the garden center structure.
- F. The General Contractor shall prepare the site and building for installation of the Garden Center structure as described in this section.

**1.03 FBO PROCEDURES**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section. General requirements related to Furnished by Owner (FBO) Items are as defined in Section 01010. All FBO Forms listed below are included as part of Section 01010.
- B. Vendor Contact: General Contractor shall send a completed "FBO Form A: Contractor Information Form" to the FBO vendor indicated below, twelve (12) weeks prior to the scheduled installation of the specified system:

Rough Brothers  
 5513 Vine Street  
 Cincinnati, Ohio 45217  
 Contact: Kevin Caron  
 E-Mail: kcaron@roughbros.com  
 Phone: (800) 543-7351 or Direct: (513) 618-7206  
 Fax: (513) 242-0816

- C. Take-Offs: FBO Vendor shall provide "take-offs" to the General Contractor as specified in Section 01010. The General

**Construction Specification****(FBO) GARDEN CENTER FABRICATIONS**

Contractor shall then verify this "take-off" using an "FBO Form B: Take Off Confirmation Sheet".

- D. Receipt of Shipment: General Contractor shall verify shipment per the requirements of Section 01010 and complete the "FBO Form C: Confirmation of Shipment" and submit back to the FBO vendor.
- E. Request for Changes: Changes to materials and quantities after receipt of shipment shall be coordinated by the General Contractor with the FBO vendor per the requirements of Section 01010 using an "FBO Form D: Request For Additional/Replacement Materials".
- F. Return Merchandise Authorization Policy: The Home Depot will add to the General Contractors' scope of work the responsibility for coordinating (1) customer accommodation return request through the FBO Vendor. Requests shall be submitted using the "FBO Form E: Returned Materials" as specified in Section 01010.

**1.04 QUALITY ASSURANCE**

- A. Codes and Standards: Material shall be designed to conform to applicable codes and standards.
- B. Manufacturer's Qualifications: Provide Metal Garden Canopy and Seasonal Shade Structure and Rainshield components produced by a manufacturer capable of showing prior production of units specified herein.
- C. Performance Standards:
  - 1. Wind Uplift: The roof system shall provide an attachment schedule signed by a Professional Engineer who is registered in the state the project is located. The work will be performed with supporting calculations to resist the uplift loads indicated on the Roof Plan Drawing.
  - 2. Deflection shall not exceed L/180.
- D. The structural design for the Metal Garden Canopy and Seasonal Shade Structure and Rainshield shall be sealed by a registered professional structural engineer, whom is registered in the state in which the project is located.

**1.05 DELIVERY, STORAGE AND HANDLING**

- A. Protect products and accessories from physical damage during transit and at project site. Store products and accessories in covered area.
- B. The General Contractor shall be responsible for off loading, counting, and checking shipping invoice. The General Contractor shall provide storage, protection, and insurance for Garden Center materials sent to job site prior to installation by the Garden Center Contractor. Once received, the General Contractor shall take full responsibility for the storage and protection of all materials.

**1.06 WARRANTY**

- A. For a period of one (1) year from Grand Opening or 16 months from the delivery of equipment, (whichever occurs first), provide a warranty. The warranty shall cover defective parts and workmanship.
- B. During the warranty period, vendor shall repair or replace parts found to have failed due to defects in parts and workmanship. If failure is due to defective parts, parts and labor shall be provided without charge.

**PART 2 - PRODUCTS****2.01 MANUFACTURER**

- A. The specifications and drawings are based upon the Metal Garden Canopy and Seasonal Shade Structure and Rainshield designed and manufactured by:

Rough Brothers

**2.02 STRUCTURAL SYSTEM: Metal Garden Canopy and Rainshield**

- A. Deflection
  - 1. The maximum allowable deflection for Structural members shall be 1:180 of the length of the member.
  - 2. Structure shall be designed to support all loads required by the local building code. In addition, the structure will incorporate the following design loads.
    - a. Dead Load: Structure and Glazing 5 lbs/sq. ft.
    - b. Hanging Load: 5 lbs/sq. ft.
    - c. Live Load: 20 lbs/sq. ft.
- B. Structure

**Construction Specification****(FBO) GARDEN CENTER FABRICATIONS**

1. Posts: Galvanized structural steel, some locations require Powder Coated Finished Galvanized steel. See plan for locations.
  2. Gutter: Galvanized steel
  3. Downspout Hats: Galvanized steel, see plan for location. Downspouts and connection to hats by General Contractor
  4. Truss: Galvanized steel weld construction.
  5. Purlins: Galvanized structural steel
  6. Fabric Coverings and Shade cloth:
    - a. Shade screens shall be 7.5 oz. green material that meets local codes and California State Fire Marshall code. Materials are made of fabrics comprised of 22% high tenacity polyester yarn and 78% flexible foamed PVC. Yarns are to be bonded at the crossover points and should have shade factor of 63%. Fabric must have a tensile strength with Warp of 125lbs/inch and Fill of 90-lbs/inch minimum per ASTM D-1682. Fabric must have tear strength of 45 lbs minimum Warp and tongue-single rip of 35 lbs minimum fill per ASTM D-2261. Fabric thickness shall be no less than 45-50 mils. All shade panels shall come sewn to size complete with reinforcing tape and suspension hooks factory installed.
    - b. Facade fabric shall be vinyl coated with polyester scrim and a weight of not less than 17 oz. per sq yard. It shall have a white underside for illumination. Flame retardant shall meet local codes and California State Fire Marshall Title 19, Section 1237 NFPA 701. The breaking strength shall be 125 lbs Warp and 121 lbs Fill, while the tear strength shall be 22 lbs Warp and 28 lbs Fill. All seams shall be electrostatic welds. Refer to drawings for fabric color.
  7. Rainshield:
    - a. Galvanized structural steel framing. Steel header beam shall be prime painted or hot dipped galvanized.
    - b. Glazing shall be opal color corrugated polycarbonate
- C. Metal Panels (refer to drawings for locations)
1. Base Material
    - a. Material: Steel
    - b. Manufacturing Standard: ASTM A-446, Grade C
    - c. Minimum yield strength: 40,000 PSI
    - d. Thickness: not less than 26 gauge
    - e. Protective coating: Zincalume: ASTM A-792-83
    - f. Protective coating components by weight: Zinc 45%, Aluminum Alloy 55%
    - g. Protective coating thickness: 1.9 mils
  2. Configuration
    - a. Pattern; Corrugated
    - b. Corrugation Spacing; 7.2" o.c.
    - c. Corrugation height: 1-1/2"
    - d. Nominal Panel width: 36"
    - e. Panel Length: as shown on drawings
  3. Color / Finish
    - a. MBCI - Snow Drift White
    - b. All other colors: Review drawings for two and one-sided Kynar-500 coatings. For one-sided prefinished metals, uncoated side shall be furnished with white factory backer coat. Color equivalencies shall be based on BHP standard colors unless otherwise noted.
- D. Translucent Panels; Refer to drawings for locations
1. Materials:
    - a. Glass reinforced equal or greater than 25%
    - b. Resin: Light stabilized fire retardant polyester, 75% by weight and modified by acrylic modification and neo-pentyl glycol additive.
    - c. Manufacturing standard: Panel classified by Underwriters Laboratory Inc with a flame spread of 25
    - d. Finish shall be embossed
    - e. Weight: 12 oz. per square foot with a maximum tolerance of +/- 5%
    - f. Color: No. 31 White
  2. Configuration:
    - a. Pattern; Corrugated
    - b. Corrugation Spacing; 7.2" o.c.
    - c. Corrugation height: 1-1/2"
    - d. Nominal Panel width: 36"
    - e. Panel Length: as shown on drawings

**2.03 ACCESSORIES**

- A. Flashing: Two piece aluminum flashing with reglet cut into wall
- B. Fasteners: Sufficient fasteners shall be provided of the size, type and holding strength required for proper erection according to manufacturer's standards and engineering requirements. Color on fasteners shall match panel color.
1. Fasteners shall be "ZAC" screws by Construction Fasteners and/or #305 self-drilling stainless steel screws. Both types shall have sealing washers. Screw/Washer system shall be used for entire roof fastening.

**Construction Specification****(FBO) GARDEN CENTER FABRICATIONS**

- C. Contour Closure: Provide rubber contour closures. Rubber contour closures shall be composed of cell synthetic rubber and furnished with sealant for top and bottom field application.
- D. Caulking: Field applied per manufacturer's recommendations
- E. Snow Guards (if shown on drawings):
  - 1. Approved Manufacturers:
    - a. Model #15 as manufactured by Zaleski Snow Guards Inc, 11 Alden Street New Britain, CT 06053 (860) 222-1614 Snow guards shall be supplied without the backer self adhering film. Adhesive shall be Everseal Surebond SB-190 or equivalent.
    - b. Sno-Gem Jr. snow guards as manufactured by SnoGem Inc McHenry IL (888) 766-4367

**2.04 CIRCULATING FANS**

- A. Acceptable Manufacturer:
  - 1. Marley or approved equal
- B. Circulating fans located under Metal Garden Canopy to be furnished and installed by Owner with connections by Electrical Contractor.

**PART 3 - EXECUTION****3.01 PREPARATION**

- A. Examine and field measure footing layout for the Metal Garden Canopy and Seasonal Shade Structure and Rainshield for correct layout and alignment.
- B. Verify that surfaces to receive the Metal Garden Canopy and Seasonal Shade Structure and Rainshield parts are free from debris.
- C. Do not proceed with installation of the Metal Garden Canopy and Seasonal Shade Structure and Rainshield until all unsatisfactory conditions have been corrected.
- D. The following are required field conditions prior to Garden Center Contractor arrival on site:
  - 1. The garden center concrete slab is complete and at the proper elevation in the entire garden center area, including high canopy areas.
  - 2. The concrete around perimeter of garden center slab is complete and at proper elevation.
  - 3. Access for tractor trailer to the garden center slab for unloading garden center materials.
  - 4. Garden Center fence is not installed.
  - 5. Store wall painted, and store wall weld plates, if required, installed and at proper elevation.
  - 6. High canopy steel is installed.
  - 7. Reasonable access to electricity for power tools.
- E. The General Contractor shall coordinate with all named parties to ensure that all dates and actions specified by the Benchmark Schedule are maintained. Any variations shall be immediately communicated to the Garden Center Contractor, the Architect, and the Home Depot Project Manager.
- F. The General Contractor will assume responsibility for any construction delays brought on by site conditions, or requirements not being met.

**3.02 INSTALLATION**

- A. Install the Metal Garden Canopy and Seasonal Shade Structure and Rainshield with experienced crew approved by manufacturer.
- B. Coordinate the installation of work by other trades, including electrical, water piping, sprinkler system, frame for openings (doors) and all systems supplied by Owner or other trades. All power and water lines including services to equipment installed under this specification shall be performed by other trades.

**3.03 CLEANING**

- A. The Garden Center Contractor shall clean all exposed surfaces promptly after completion of installation as required.
- B. The General Contractor shall clean glazing in accordance with manufacturer's recommendations prior to Turnover as required.

**3.04 PROTECTION**

- A. Protect work as required to ensure all exposed surfaces will be without damage to time of final completion.

- B. Replace damaged work that cannot be restored to original condition.

END OF SECTION

**Construction Specification****FIRE PROTECTION AND FIRE PUMP****PART 1 - GENERAL****1.01 SUMMARY**

- A. Work in this Section includes, but is not necessarily limited to, design, permitting, labor, materials, supervision, testing, inspections to obtain final acceptance of the automatic fire protection sprinkler system complete in all respects.
- B. Related work specified elsewhere includes but may not be limited to:
  - 1. Division 2 Site work
  - 2. Division 7 Thermal and Moisture Protection
  - 3. Division 9 Finishes
  - 4. Division 10 Specialties
  - 5. Division 11 Equipment
  - 6. Division 15 Mechanical
  - 7. Division 16 Electrical/ Fire Alarm System

**1.02 DESCRIPTION OF WORK**

- A. The Contractor shall provide the final shop drawing sprinkler design, assistance in obtaining plan approval and permitting (as specified in section 1.05 of this specification), materials, labor, supervision, and testing and inspections required to obtain final acceptance of the automatic fire protection sprinkler system complete in all respects.
- B. Access panels shall be provided by the Contractor, as specified elsewhere.
- C. As specified elsewhere, fire stopping shall be provided by the Contractor.
- D. The Contractor shall provide additional structural members (joist struts) to add strength to the building structure for attachment of hangers and bracing as necessary (see hanger notes and details provided on Contract Documents).
- E. The Contractor shall provide and install required rack barriers as detailed and required.
- F. The underground supply lead-in shall be provided and installed by the Contractor at the exact location inside the building as specified on the Contract Documents.

**1.04 GENERAL REQUIREMENTS**

- A. The Contractor shall coordinate methods and sequences of construction and separation of responsibilities between subcontractors, including but not limited to:
  - 1. Sleeving, concrete cutting and coring, wood members and steel fabrications other than building structure which are required for proper support of piping and equipment, etc.
  - 2. Horizontal and vertical layout of fire sprinkler piping to avoid interference with structural members, lighting, busways, mechanical equipment, piping conduit, wire ways, smoke vents, skylights, roof penetrations, etc..
  - 3. Rack barrier locations and requirements
  - 4. Location of underground supply lead-in to the fire pump/riser room.
  - 5. Location, type, size, and number of fire department connections.
  - 6. Transition of underground piping to overhead piping.
- B. It is the responsibility of the Contractor to be familiar with all federal, state, and local requirements in regard to fire protection.
- C. The Contractor shall provide all pipe threading and grooving machines, tools, man lifts, safety equipment, cutting oils, pipe dope, rubber gasket soap, Teflon tape, etc., needed to install the system. Contractor shall ensure that no pipe threading takes place on any poured slab, and that all finished interior and exterior surfaces are protected from damage and staining.
- D. The Contractor shall verify that the underground main line(s) have been flushed and tested in accordance with local requirements and NFPA standards. The Contractor shall provide confirmation of hydrostatic tests and system flushing to Telgian prior to making connection to the underground lead-in at 6" AFF in the pump/riser room. If flushing has not occurred prior to the time that the connection is scheduled, the Contractor shall flush the underground. Contractor shall include flushing the underground main at no extra cost to the owner.

**1.05 SYSTEM DESCRIPTION**

- A. System shall provide coverage for all building areas including, but not limited to, areas indicated in Contract Documents. Contract Documents have been prepared in accordance with NFPA 13 as "working plans", except for fabrication information. These Contract

**Construction Specification****FIRE PROTECTION AND FIRE PUMP**

Documents have been prepared to a level consistent with that level required by the Authorities Having Jurisdiction to gain plan check approval. The Contractor shall not make any changes in design area, number of sprinklers operating, pipe sizes, number of branch lines, number of mains, or deviation of water supply from that shown on the drawings. Telgian will not approve any such modifications by the Contractor. This is not intended to limit the Contractor from making minor modifications to system design for coordination purposes. The Contractor shall review the Contract Documents for completeness and to ensure that the Construction Documents meet all Authorities Having Jurisdiction requirements. Discrepancies with NFPA or Authorities Having Jurisdiction requirements shall be brought to the attention of Telgian prior to bid submittal. The Contractor shall complete the fire protection Contract Documents to provide all final required detail such as fabrication details, final pipe cuts, hanger cuts, and other miscellaneous details not required by the Authority Having Jurisdiction for approval. Contractor is responsible to coordinate design with all trades and disciplines.

1. Telgian has submitted Contract Documents to Authorities Having Jurisdiction for review and approval. Contractor shall provide all assistance, other required documents, qualifications, submittals and coordination necessary to obtain approval by Authorities Having Jurisdiction. All changes made to the Contract Documents by the Contractor shall be submitted to Telgian for approval prior to fabrication or installation. Refer to Section 01330 for submittal requirements.
- B. The fire protection system shall provide for full and complete coverage of all areas, shall be compatible with the Contract Documents layouts, and avoid interference with work of all other trades in the building.
- C. Install all fire protection system piping to run within the roof framing above the bottom chord of the bar joists and as tight to the roof deck as possible.
- D. Provide fire protection system complete with all UL Listed components or Factory Mutual approved equipment and material items. Install and test in full conformity with the requirements of all applicable codes, National Fire Protection Association (NFPA) standards, local code enforcing agencies, and Telgian.
- E. Sprinkler deflectors shall be positioned with relation to obstructions and ceilings as per NFPA 13.
- F. Sprinklers in finished ceilings shall be symmetrically spaced to provide proper coverage and to avoid interference with lights, diffusers, grilles, and other ceiling mounted equipment. Sprinklers located in ceiling tiles shall not be closer than 6-inches to a "T" bar grid and conform to a typical pattern.
- G. Backflow prevention and meter requirements shall be provided as specified in the Contract Documents and as required by the Authorities Having Jurisdiction. Acceptability of the backflow assembly must be approved by the Authorities Having Jurisdiction, including the local water authority prior to installation.
- H. Inspectors Test Connections shall be provided with half inch orifice, discharging at six inches above a hard paved surface. Inspectors test connections shall not be located behind racking or other obstructions, and shall be located within 12 inches of the latch side of an exterior door opening. Inspector's test shall be piped to a location acceptable to the owner's representative. Inspector's test discharge shall not flow where merchandise or pedestrian traffic is present or into any obstructions, such as doors, or into enclosed spaces such as vestibules. Riser mounted Inspectors Test Connections can be provided if approved for use by the Authorities Having Jurisdiction.
- I. Hose connections shall be installed as shown and located on the Contract Documents, and as required by Authorities Having Jurisdiction. Final locations and quantities subject to approval of the owners' Project Manager. All drops to hose connections, as well as all drops to piping in racks, or along walls shall be coordinated with the owners' Project Manager prior to installation.
- J. Provide flushing and drainage as required per NFPA 13.
- K. Provide a calculation information card showing system demand and pressure required at the base of the riser, design density and area calculated, as well as the installing Contractor's address and phone number. Card shall be metal, and affixed to each riser with a chain. Other type cards, or cards not affixed with chain will not be acceptable.
- L. Contractor shall provide and install appropriate signs and labels for all control valves, hose valves, dry pipe valves, drains, test connections, etc. as required by the Authority Having Jurisdiction. All exterior signage, interior and exterior painting, and protection of equipment (such as cages, bollards, and other barriers) shall be provided by the Contractor.
- M. System control valves shall be provided as shown on the provided Contract Documents. All control valves shall be supervised and monitored through the fire alarm/ supervisory system and clearly marked as to their function and location.
- N. Provide sprinkler protection at electrical rooms per the requirements of the Authorities Having Jurisdiction. No main piping is permitted in the electrical room and the sprinkler supply to the electrical room shall be a dead end piping (no pass-through), and shall not be routed above electrical panels. Where required, provide shielding of electrical equipment and special routing of fire sprinkler piping to satisfy all AHJ requirements.
- O. Provide exterior audible water flow alarm devices as indicated on the Contract Documents, mounted outside the fire pump/riser room, and at other locations shown on the Contract Documents. The alarm device shall be located a minimum of 10 ft. above finish grade unless another location is specified by the Authorities Having Jurisdiction.

**Construction Specification****FIRE PROTECTION AND FIRE PUMP**

- P. Route all piping around all obstructions and provide sprinkler protection under mechanical units, ducting, or other obstructions as required by NFPA 13.
- Q. Systems shall be monitored by an off site Central Station including tamper switches on all valves, system flow detection devices (wet and dry), low air pressure switches (dry systems), and fire booster pump control panels as applicable as provided under Division 16 Fire Alarms/Life Safety System.
- R. In rack sprinklers shall be supplied by a separate riser located in the fire pump/ fire riser room. Contractor shall provide in the bid pricing, all design, materials and labor required for the installation of the complete in rack sprinkler system. Final Rack locations may vary somewhat from that shown on the bid documents. Contractor may fabricate and install roof level in rack feed piping prior to issue of "IR1" plan. Contractor shall not fabricate nor install any drops to, or piping within racking until "IR1" plans are issued by the Telgian which will correspond to the owners' final fixture plan. When "IR1" plans are issued, Contractor shall submit adjustments to contract to obtain approval from the owner prior to installation of "IR1" piping.
- S. Provide pressure relief valves on all systems at the riser assembly as shown on the provided Contract Documents, unless otherwise required by the Authorities Having Jurisdiction.

**1.06 SUBMITTALS**

- A. Submit completed shop drawings and material data for review and approval to Telgian within fifteen working days of the award of contract. Submittals shall be made in one submission only. No partial submittals will be accepted. Partial submittals will be discarded until complete submittals are received, this may delay shop drawing review.
- B. Transmit one electronic set in pdf format of all fire protection submittals to Telgian contact email listed below. Send one copy of the submittal transmittal to the Architect:  
Telgian  
900 Circle 75 Parkway SE, Suite 680  
Atlanta, GA 30339  
(770) 432-3882  
Home\_Depot\_Projects@telgian.com  
Attn: Project Logistics Team
- C. Deliver all certificates of inspections to Telgian prior to final acceptance by owner.
- D. Installation shall commence upon approval from Telgian and Authorities Having Jurisdiction.
- E. Contract Closeout Submittals:
  - 1. Maintenance Data: Include components of system, servicing requirements, inspection data, and owner's manuals.
  - 2. Training Requirements: Provide operational training to Owner. Include system control operation, Fire Pump (if provided) manual and abort functions, trouble procedures, auxiliary functions and emergency procedures.
  - 3. As-Built shop drawings indicating installed location of components, including all piping, sprinklers, hangers, valving, inspector's test stations, auxiliary drains, and hose stations (if required).
  - 4. Contractor's Record Letter of Conformance for Fire Suppression: Prior to Fire Sprinkler Site Observation and Acceptance Test Contractor will issue Contractor's Record Letter of Conformance for Fire Suppression to Telgian indicating that the contractor has pre-tested all systems and the systems are complete. The Contractor shall complete the Record Letter of Conformance, obtaining all signatures (Sub Contractor, and Contractor) and submit to Telgian.
  - 5. One Record Letter of Conformance shall be completed and submitted for all Fire Sprinkler Systems, Fire Pump Systems and Water Storage Tanks associated with the project.
  - 6. At project completion, provide the As-Built Drawings enclosed in a plastic pipe tube (fixed cap at one end and a threaded-cap on the other end) and install in the Riser Room.
  - 7. As-built sprinkler shop drawings shall be provided to Telgian upon the completion of punch list items and prior to final acceptance by Owner. Final payment will not be made until as-built drawings are received by the Owner.

**1.07 QUALITY ASSURANCE**

- A. Reference Standards: Comply with applicable provisions of the following published standards and specifications unless noted otherwise.
  - 1. NFPA 13, 2010 edition, Standard for the Installation of Sprinkler Systems
  - 2. NFPA 20, 2010 edition, Standard for the Installation of Stationary Pumps for Fire Protection
  - 3. NFPA 24, 2010 edition, Standard for the Installation of Private Fire Service Mains and Their Appurtenances
  - 4. NFPA 30, 2008 edition, Flammable and Combustible Liquids Code
  - 5. NFPA 30B, 2007 edition, Manufacture and Storage of Aerosol Products
  - 6. FM Data Sheet 8-9 Storage of Class 1,2,3,4 and Plastic Commodities (Expanded Plastics)



**Construction Specification****FIRE PROTECTION AND FIRE PUMP**

## 7. Other as indicated on the Contract Documents

- B. Qualifications (Design and Installation): Design and Installation of automatic sprinkler systems shall be performed by a licensed and certified fire sprinkler subcontractor. The fire sprinkler subcontractor shall have a minimum of five years experience with the installation of sprinkler systems in similar type occupancies and shall be able to furnish evidence of such qualifications. References of satisfactory installations shall be furnished upon request. Company performing work of this Section shall have a minimum of a NICET Certified Engineering Technician (Level III) Fire Sprinkler Designer on staff responsible for project. NICET Technician (Level III minimum) shall include certification information and sign all submittals.

## 1.08 PERMIT FEES AND NOTICES

- A. All fees and costs associated with plan review and permitting shall be the responsibility of the Contractor.
- B. The Contractor shall apply for and obtain all permits for installation of the fire sprinkler systems, standpipe/hose station systems, and fire pump system, including any air quality management district approval where required.

## 1.09 WARRANTY

- A. Provide warranty in accordance with the General Conditions.
- B. Pump manufacturer shall provide one-year warranty at no additional cost with single responsibility for the pumps, motor, and controllers.
- C. The Contractor shall further warrant that in the event of the failure of any system or its component equipment items, or the improper functioning thereof, during the period of the warranty, the Contractor shall have available, and on call, competent service personnel for the restoration of all systems and equipment for complete operation. Should the nature of the failure be such as to present an emergency, in the opinion of the Owner, such personnel shall be promptly available, regardless of the hour of the day or the day of the week. Should the failure be such as to fall under the warranty, the cost of the service shall be borne by the Contractor. Otherwise, the owner will pay at the prevailing rate for such services.
- D. If service personnel are not promptly available "on call" as required by the warranty, the owner may employ such personnel as are available to him at the expense of the Contractor.

## PART 2 - PRODUCTS

## 2.01 FIRE PROTECTION MATERIALS

- A. All materials shall be as required by applicable codes and standards. All equipment used shall be UL listed and/ or Factory Mutual approved for use in fire sprinkler system installations.
- B. Fire sprinklers shall be provided as shown on the provided Contract Documents. All sprinklers shall be UL listed and Factory Mutual Approved. Strictly observe the orifice sizes, temperature ratings, finishes, and other criteria shown on Contract Documents.
- C. Escutcheons at pendent sprinklers located in suspended grid ceilings tiles shall be "recessed" type. Escutcheons for all other finished ceiling pendent sprinklers shall be two-piece adjustable ("401" type).
- D. Contractor shall include in their cost, corrosion protection for sprinklers when required by the Authorities Having Jurisdiction.
- E. Provide a minimum of two complete equipped sprinkler cabinets with twenty-four (24) EC-25 sprinklers and six (6) of each other type of sprinkler used and appropriate sprinkler wrenches.
- F. Hangers, line restraint assemblies, seismic bracing, or thrust bracing attachments to building structure shall be per the requirements of NFPA 13 and as shown on the Contract Documents. All hanger materials shall be UL listed and/ or Factory Mutual approved for use in the support or bracing of fire sprinkler system piping.
- G. All piping shall be new and approved for 175 psi working pressure conforming to ASTM specifications and listed/ approved by UL or FM for fire sprinkler system installation. All piping shall be black steel, prepared for painting. Contractor shall include in his cost, corrosion protection for sprinkler piping when required by the local jurisdiction. Shop welding to be done in accordance with AWS D10.9 and NFPA 13. Contractor shall provide all welding stamps, certificates, or other documentation as required to gain approval from all authorities. These stamps shall be placed at each welded outlet, and/ or as required by the local authorities. Contractor shall arrange for all weld inspections as required by the local authorities. Pipe shall have a corrosion resistance ratio of 1.0 or greater after threading. No on-site welding is permitted.
- H. Crimp type installations are not acceptable.
- I. Plain end fittings (socket, FIT, roustabouts, etc) shall not be used.

**Construction Specification****FIRE PROTECTION AND FIRE PUMP****2.02 FIRE PUMP**

- A. This section includes providing material and installation for a complete fire pump and controller package with all components and accessories as required for a complete and operable system per NFPA 20. Fire pump, controllers, and all related equipment shall be UL listed and FM approved.
- B. Manufacturer:
  - 1. Specified manufacturers: ARMSTRONG PUMPS - No others are acceptable.
- C. Within seven (7) working days of award of contract, Contractor shall coordinate all space requirements, mechanical requirements, water supply requirements, electrical requirements, and alarm requirements with the appropriate Contractors.
- D. Contractor shall connect to controllers per manufacturer's wiring diagrams. The pump room shall have a unit heater within and shall be kept at a temperature of 42F or above. The room shall have required venting, internal lighting, and a sanitary drain connection of at least 4" diameter. The floor drain shall be located within the room at a location designated by the Contractor. All pump drains shall be piped to the floor drain location.
- E. Fire pump shall be as shown and as rated on the Contract Documents. The unit shall be designed to deliver not less than 150% of rated capacity at 65% of rated head. The motor, as shown on the Contract Documents, shall have sufficient horsepower to operate the fire pump under any condition of pump load.
- F. Electric Fire Pump shall be a UL/FM In-Line Vertical Pump design, with a minimum flow rating of 1500 gpm, high grade cast iron casing, replaceable bronze wearing rings, bronze impeller, high quality steel shaft with non-corrosive shaft sleeve, packed gland with external flushing line to the lantern ring suitable for 125 psig suction pressure.
- G. Packing box glands shall be bronze split type. Provide 1/2" copper or galvanized steel piping to collect and route packing box drainage to floor drain in fire pump room.
- H. The jockey pump shall be designed to correspond to the fire booster pump specified. The pump shall be a vertical multi-stage, close coupled to an ODP motor. The motor shall operate on 480V, 3 phase, and 60 Hertz power. Coordinate electrical requirements with all other trades.
- I. The Contractor is responsible for furnishing all necessary labor and equipment including play pipes and hoses for complete and accurate fire pump testing.

**2.03 FIRE PUMP MOTOR**

- A. Manufacturer: As specified by pump manufacturer.
  - 1. All drivers must be UL listed and Factory Mutual approved for use with the specified fire pump.
  - 2. Pump motors must be manufactured in the U.S. No import electric motors.
  - 3. Motor and all components shall be UL and ULC listed and FM approved. Motor shall be 480V, 3 phase, 60 hertz. Coordinate all electrical requirements with all other trades.

**2.04 CONTROLLER**

- A. Specified manufacturer: Firetrol, Metron, Joslyn Clark, Cutler-Hammer
- B. Controller and all components shall be UL and ULC listed, and FM approved.
- C. Controller shall be combined automatic manual type, arranged to start the fire pump motor automatically on loss of pressure with manual stop.
- D. Provide an automatic transfer switch when required by the Contract Documents or the Authorities Having Jurisdiction.
- E. When a transfer switch is required by the local authority, a "Wye-Delta, Closed Transition" start fire pump controller shall be provided.
- F. When a transfer switch is not required, an "Across-the-Line" start fire pump controller shall be provided.

**Construction Specification****FIRE PROTECTION AND FIRE PUMP**

- G. Provide a Jockey Pump Controller with a fused disconnect.

**PART 3 - EXECUTION****3.01 INSTALLATION**

- A. Furnish and install under this Section all hangers and steel fabrications, other than building structure, required for proper support of piping and equipment. All support criteria listed in Contract Documents is based on the use of schedule 10 piping no larger than 8" nominal diameter. Heavier piping may only be used with prior written approval from the Architect and Structural Engineer of record.
- B. All piping, piping supports, seismic bracing & line restraint, hangers and attachments shall be sized as required by NFPA-13 and shall be capable of resisting seismic forces as required by the more stringent of the requirements of NFPA-13 or Authorities Having Jurisdiction.
- C. Hanger attachment:
1. Do not hang or support any loads or make any attachments to the metal roof deck or joist bridging.
  2. No cutting, punching, or penetrations are permitted in any structural member without prior written approval from the Architect of record.
  3. Provide all necessary piping supports, hangers, attachments, seismic bracing, and line restraint complying with the more stringent of NFPA 13 or local building code requirements. Provide thrust bracing as detailed elsewhere in this specification.
  4. Provide sprinkler main and branchline piping at the locations where shown on the Contract Documents. Main piping may not be relocated without the written permission of the Architect of record.
  5. All hangers and pipe supports shall be secured to the top chord of steel joist girders or steel joists using beam clamps. Attachments shall only be made within 6" of girder or joist panel points unless supplemental joist load struts are provided at the points of support.
  6. Where 6" and larger sprinkler pipes run parallel to the steel joists, sprinkler pipe shall be located between joists and supported from each joist by use of trapeze members. Mains cannot be closer than 2'-0" of the centerline of a joist.
  7. Concentric hanger attachment is required for all piping 6" and larger as detailed in the Contract Documents.
  8. Where sprinkler lines run parallel to the steel joists, the maximum distance between supports shall be 8 feet.
  9. Where sprinkler piping runs perpendicular to the steel joists, sprinkler piping shall be supported at alternate joist to a maximum spacing per NFPA 13 requirements.
- D. Placement of fire sprinkler piping and steel joist bridging shall be coordinated by the Contractor. The Contractor shall make provisions for the steel erector to adjust/relocate bridging or adjust or relocate piping where conflicts occur. All changes required of the joist bridging shall be designed by joist manufacturer.
- E. Filling the sprinkler system with air or water shall be done in such a manner as to minimize any horizontal thrust or undue lateral force. Contractor shall ensure that all piping is installed and left straight and plumb.
- F. Any deviations and changes from the above criteria must be brought to the attention of the Structural Engineer in writing.
- G. The Contractor is cautioned to coordinate the locations of all cross mains and feed mains with the structural plans. Whenever the location of a feed main or cross main are shown on the structural drawings, the Contractor shall coordinate these locations with the final fire sprinkler shop drawings prior to installation. Any deviations need to be submitted to the attention of the Architect of record for the Structural Engineer's review. Deviations that result in additional engineering fees and/or fabrication costs shall be the responsibility of the Contractor. Failure to coordinate with the structure will result in removal and relocation of the piping at the expense of the Contractor.

**3.02 PAINTING**

- A. All horizontal piping shall be installed prior to painting.
- B. Preparation and painting of the sprinkler piping and equipment shall be by the Contractor.
- C. The Contractor is to remove all labels, stickers, fabrication identification tags, excess pipe dope, Teflon tape, oil residues and grease from the sprinkler piping before the system is painted.
- D. The Contractor is to install protective plastic bags on all sprinklers in areas where the roof deck and/or structural systems are to be painted. In addition, all brass valves shall be protected from painting. Painted valves (other than by the manufacturer) shall be replaced at no additional cost to the owner.

**Construction Specification****FIRE PROTECTION AND FIRE PUMP**

- E. The Contractor is to remove all plastic bags and valve coverings after final painting is complete. The Contractor shall make this known to all subcontractors.
- F. Any sprinkler over sprayed with paint shall be replaced. Cleaning of sprinklers to remove paint is not acceptable. Painted sprinklers shall be replaced at no additional cost to the owner.
- G. The Contractor shall furnish a signed statement on his letterhead and place it in the operating instruction and maintenance manuals that he has verified that all plastic bags have been removed from the sprinklers and that all sprinklers over sprayed with paint have been replaced.
- H. Contractor shall label each system riser with the system number/identification using stenciled 1 in. minimum letters painted on each riser

**3.03 FIRE PUMP INSTALLATION**

- A. Contractor to install all Fire Pump and related equipment as detailed on the Contract Documents, and as required by NFPA 20.
- B. Provide concrete housekeeping pads at pump/motor skid base and jockey pump. Skid base shall be grouted in with 2% expansion grout to create domed surface for drainage. Housekeeping pads shall be located, sized, and constructed as shown on the Contract Documents. Contractor shall field verify size and location after receipt of pump.
- C. Contractor to install anchoring for pump/motor unit, intake and discharge lines, per seismic calculations (where required) prepared by the structural engineer, based on the unit's weight and center of gravity as provided by the manufacturer.
- D. The Contractor to provide conduit and wiring from a separate dedicated service connection directly to the Fire Pump controller (480 VAC, 3 Phase).
- E. The Contractor to provide conduit and wiring between the main controller and the Electric Fire Pump Motor as required.
- F. The Contractor to provide conduit from controller and monitoring devices to alarm panel inside building. The Contractor to connect alarms to the terminal strip inside the control panel to monitor: Loss of AC power to controller, pump running, phase reversal and motor overload,
- G. The Contractor to provide conduit and wiring for connection between main power distribution center to the Jockey Pump Controller, and between the Jockey Pump controller and jockey pump after the pump installed.
- H. Provide all test equipment, including but not limited to hoses, play pipes, pitot gauge, etc.

**3.04 INSPECTION, TESTING AND CLEANING**

- A. Arrange for all inspections, examinations, and tests in full conformity with the requirements of all applicable codes, National Fire Protection Association (NFPA) standards, Authority having jurisdiction, and Telgian as necessary to obtain complete and final acceptance of the fire sprinkler system. The minimum test certificates to be submitted to the Architect of record prior to final acceptance shall be overhead hydrostatic test's, overhead final, underground flush, fire pump acceptance test, and fire sprinkler system building final.
- B. Flush underground piping and pressure test at 200 psi for 2 hours prior to connection to overhead piping. Flushing and testing shall be witnessed by the Fire Department. It shall be the responsibility of the Contractor to ensure that satisfactory flushing of the underground piping has occurred prior to connection to overhead sprinkler piping. Any damage to fire protection equipment resulting from an improperly cleaned water supply system shall be the responsibility of the Contractor.
- C. Leave entire sprinkler system clean in every respect at the conclusion of the work.
- D. After the systems have been installed, tested, and accepted, the Contractor is to provide three copies of the operating instructions and maintenance manuals of all equipment. Included with these manuals are; a copy of the approved shop drawings, copy of NFPA 25, a spare parts list and a list of phone numbers of emergency repair personnel to Telgian and the owner.
- E. The Contractor shall perform all fire protection and related systems acceptance testing to be witnessed by Telgian. Testing will occur after installation of all systems has been completed. The Contractor shall be required to provide a lift, air and water pumps for system pressurization, and any necessary hand tools and apparatus for complete testing and draining of the systems. One test of all systems should be completed within (1) day. If all or any systems fail, the Contractor shall be responsible to be present and furnish all items listed above until such time that the systems are found acceptable and in accordance with NFPA 13, 25, building and fire codes (including local ordinances) and the Contract Documents. The Contractor is responsible for notifying Telgian when installation is complete and testing may begin. Please allow 15 working days for scheduling.
- F. General: Contractor shall schedule, coordinate, and conduct all tests required by Authorities Having Jurisdiction and Telgian. Contractor shall modify, replace, or retest as required by Authorities Having Jurisdiction and Telgian.

**Construction Specification****FIRE PROTECTION AND FIRE PUMP**

- G. Flush, test, and inspect sprinkler system according to NFPA 13 "Systems Acceptance" Chapter. Test the systems, including the underground water mains, and the aboveground piping and components to assure that equipment and components function as intended. Pressure test the systems in accordance with NFPA 13 and NFPA 24. The Contractor shall have available copies of as-built drawings.
1. Under Ground Fire Protection Piping - Test per NFPA 24. Flush underground mains and lead-in connections thoroughly to remove foreign material before connection is made to above ground system piping. Minimum flow rate shall not be less than the maximum water flow demand rate of the system and not less than necessary to provide a velocity of 10 feet per second. Continue flushing for sufficient time to ensure thorough cleaning. Provide proper disposal of water from flushing operation. Perform Hydrostatic tests per NFPA 24.
  2. Above Ground Fire Protection Piping - Test per NFPA 13. Inspect welds and verify welder's qualifications per Authorities Having Jurisdiction. Perform Hydrostatic tests per NFPA 13.
  3. Backflow Prevention Assembly Forward Flow Test.
  4. Operation of control valves and flowing of inspector's test connections to verify operation of alarm devices including alarm switches. After operation of control valves has been completed, assure that control valves are in the open position.
  5. Main Drain flow test.
- H. Fire Sprinkler System Construction Follow Up: Telgian will conduct a Pre Construction Conference Call, Mid Installation Site Observation, and Fire Sprinkler Site Observation and Acceptance Test (FPAT). The purpose of the Pre Construction Conference call is to review status of project, notify contractor of status of approvals, and review project expectations. The purpose of the Mid Installation Site Observation is to verify type of material, progress of installation (rough-in should be complete and ready for ceiling paint), and, if possible, re-verify available water supply. The purpose of the Fire Sprinkler System Site Observation is to determine if the fire sprinkler systems are in general conformance with Contract Documents and shop drawings. The Contractor shall coordinate with Telgian for the time and date of the test. Scheduling for the FPAT shall begin one month prior to possession with FPAT being conducted one to two weeks prior to possession. FPAT shall occur prior to possession. A representative sample checklist is available upon request.
1. Pre Construction Conference Call: The Contractor shall contact Telgian within 1 week after Contract Award to schedule the Pre Construction Conference Call with the Contractor, Fire Sprinkler Contractor, and Fire Pump Vendor (if applicable). The conference call will be held within 2 weeks after Award. Mid Installation Site Observation will be scheduled at the time of the Pre Construction conference call.
  2. Mid Installation Site Observation: Telgian will meet the Contractor and Sprinkler Contractor representatives at the scheduled time. Mid Installation Site Observation will be conducted and documented. FPAT will be scheduled at time of Mid Installation Site Observation.
  3. FPAT: Telgian will meet the Contractor, Sprinkler Contractor and Alarm Contractor representatives at the scheduled time. At scheduled time, Contractor/Sprinkler Contractor shall be ready to initiate Acceptance tests as outlined herein. Prior to initiating tests, the following information shall be reviewed and copies provided to Telgian:
  4. Completed Contractor's Material and Test Certificate for Underground Piping. Provide the completed Contractor's Material and Test Certificate for Underground Piping provided at the end of this Section. All portions of the certificate shall be completed. If Completed form is not available certifying underground has been properly flushed, hydro tested, and leak tested, Acceptance tests cannot be performed, requiring all parties to reschedule test. Rescheduling may take up to four weeks, and may result in Contractor being back charged for Telgian's additional time and expenses. It is critical that completed Contractor's Material and Test Certificate for Underground Piping certifying proper flushing, hydro testing, and leak testing has been accomplished.
  5. Contractor's Material and Test Certificate for Aboveground Piping (By System). As a minimum, the form shall contain information indicated in sample form shown in NFPA 13. Certificate shall be complete and verify all information except Dry pipe test section and hydrostatic test section. Dry pipe section may be completed during Acceptance Test. Hydrostatic test may be completed in the future and a copy forwarded to Telgian at a later date.
  6. Sprinkler Zone Map.
  7. Approved Shop Drawings.
  8. Fire Pump Factory Test Curve (if applicable).
- I. After these documents have been reviewed, Acceptance Test shall be initiated by Contractor/Sprinkler Contractor in the order determined by Telgian. Each of these tests shall be interfaced with the fire alarm system. Contractor shall arrange for system to be put in test and arrange to be able to silence local alarms during Acceptance Test. Alarm Technician shall be on site and available to assist during the Acceptance Test. The Contractor shall provide all personnel, material, equipment, lifts, air and water pumps, hand tools, and apparatus necessary to complete the above required testing. The Contractor shall notify the store management that the above tests are scheduled.
- J. The following tests shall be conducted by the Contractor/Sprinkler Contractor and witnessed by Telgian. Generally this is the order the tests shall be conducted, but the Telgian may require tests be conducted in any order deemed appropriate. Determination of order will be made while on site.
1. Fire Pump Systems (if applicable): Sprinkler Contractor shall conduct a full NFPA 20 acceptance test, including (but not limited to) flow (churn, 100%, and 150%), manual and automatic starts, etc. Sprinkler Contractor shall provide all equipment and personnel necessary to conduct test. Verify flushing and pre-start preparation prior to test. Typically, this is the first test in the Acceptance Test and is conducted in conjunction with the Fire Pump Manufacturer for Fire Pump Certification.
  2. Water Storage Tank (if applicable): Sprinkler Contractor shall drop water level, overflow tank, and operate tank heaters. Typically, this is the second test in the Acceptance Test.

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**Construction Specification****FIRE PROTECTION AND FIRE PUMP**

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3. Water Flow Test: Contractor or Sprinkler Contractor shall conduct a water flow test in accordance with NFPA 291 near the lead in to the fire sprinkler system to verify anticipated water supply is available. If a fire pump is present, and tested, this test will not be required. For projects without fire pumps, this is typically the first test in the Acceptance Test.
  4. Inspector's Test: Sprinkler Contractor shall operate each Inspector's Test to verify flow switch operates within 90 seconds (preferred time is 45 seconds, minimum time is 30 seconds).
  5. System Control Valves: Sprinkler Contractor shall operate each system control valve to verify functionality. This test typically follows the Inspector's Test Acceptance Test.
  6. Antifreeze Systems (if applicable): Sprinkler Contractor shall test antifreeze mixture to verify proper solution ratio. This test typically follows the System Control Valve Acceptance Test.
  7. Hydrostatic Test: Sprinkler Contractor shall hydrostatically test all systems simultaneously. Typically this will be the last test initiated, and depending on schedule may not be fully witnessed by Telgian. Contractor/Sprinkler Contractor shall certify and provide signed off copies of test certificates proving successful completion of Hydrostatic tests prior to full acceptance.
- K. In addition to conducting the Fire Protections Systems Acceptance Test, a Fire Sprinkler System Site Observation of the installed systems will also be conducted. Telgian will conduct and document a site observation of the fire sprinkler systems (and fire pump / tank as applicable). At the conclusion of this Observation, an exit interview will be conducted with the Contractor to review and identify issues that need correction prior to acceptance of the system.
- L. Replace sprinkler system components that do not pass test procedures and retest to demonstrate compliance. Repeat procedure until satisfactory results are obtained. The installation shall not be considered accepted until identified discrepancies have been corrected and test documentation is properly completed and received. If FPAT is required to be repeated or rescheduled due to unsatisfactory results rescheduling could take up to four weeks, and may result in Contractor being back charged for Telgian additional time and expenses.

END OF SECTION

**PART 1 - GENERAL****1.01 WORK INCLUDED**

- A. This Section includes furnishing materials and installation of fire extinguishers to the extent indicated by NFPA 10 requirements and the Local Authority Having Jurisdiction.
- B. The owner shall supply and install the referenced products. The General Contractor is responsible for contacting the supplier two (2) weeks prior to installation for any coordination required between the Vendor and the General Contractor.
  - 1. Initial Visit: During the week prior to take over to provide and install fire extinguishers around the inside perimeter.
  - 2. Final Visit: One week prior to the opening to provide and install all other fire extinguisher throughout the store.

**1.02 REFERENCES**

- A. Unless otherwise shown or specified, this work shall conform to the following standards:
  - 1. National Fire Protection Association: **NFPA 10 Standard for Extinguishers**
  - 2. Underwriters' Laboratories, Inc.: UL Fire Damageability Standards
  - 3. Local Authority Having Jurisdiction.

**1.03 QUALITY ASSURANCE**

- A. Failure Criteria: Not limited to the following:
  - 1. Loss of pressure in extinguisher.
  - 2. Loosening of bracket from wall.

**1.04 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver materials to site by representative company of Real Time Solutions in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Store materials indoors in a clean, dry area in accordance with manufacturer's instructions.
- C. Protect materials and finish from damage during handling and installation.

**PART 2 - PRODUCTS****2.01 SUPPLIER**

- A. **Cintas Fire Protection**  
Contact: Norma Puerto  
Phone: (866) 246-8273  
Fax: (866) 246-8272  
e-mail: [PuertoN@cintas.com](mailto:PuertoN@cintas.com)

**2.02 MATERIALS**

- A. Fire Extinguishers and Brackets: Amerex Products, quantity, type, sized, rating and use as indicated in chart below.
  - 1. Hazard Classification: Low to Moderate **(Need to modify this per NFPA terminology)**
  - 2. Fire Classification: A
    - a. Multi-Purpose, 10lb ABC Dry Chemical, rated 4A60BC "General Use" (Quantity 60)
      - i. Heavy Duty Bracket with Metal Straps (Quantity 60)
    - b. **"Special Hazard"**, 2.5 Gal. Water, rated 2A, Pool and Spa Chemical Area (Quantity 2)
      - i. Heavy Duty Bracket with Metal Straps (Quantity 2)
  - 3. Fire Classification: B
    - a. **"Special Hazard"**, 10lb Carbon Dioxide, rated 10BC. Main Electrical Room. (Quantity 1)
      - i. Heavy Duty Bracket with Metal Straps (Quantity 1)

**(I would suggest adding a 2A:10B:C to the offices and break room/training room areas.)**
- B. Fire Extinguisher Signs: Red stick-on vinyl "Fire Extinguisher" sign with arrow pointing down placed above fire extinguisher locations.

**PART 3 - EXECUTION****3.01 EXAMINATION**

- A. Examine areas to receive units. Notify Architect if areas are not acceptable. Do not begin installation until unacceptable conditions have been corrected.

**3.02 INSTALLATION**

- A. Install units in accordance with manufacturer's instructions at locations to comply with NFPA 10 guidelines.
- B. Secure brackets to metal or wood studs using screws supplied by installing company.
- C. Place stick on vinyl arrow down sign above fire extinguisher location.
- D. Certify and tag each fire extinguisher as required by NFPA 10 and Local Authority Having Jurisdiction.
- E. Based on square footage and placement, some locations may have a slightly larger quantity of fire extinguishers than necessary for proper coverage. In this event, any unused fire extinguishers are to be designated as "spare" and stored in a secure place to be available for immediate replacement if a fire extinguisher of same type and size is damaged or used.
- F. Maximum mounting height to be 48" above floor (at top of unit)

**3.03 PROTECTION**

- A. Protect units from damage during construction.

**END OF SECTION**



**Construction Specification****(FBO) PNEUMATIC TUBE SYSTEM (AEROCOM)****PART 1 - GENERAL****1.01 SUMMERY**

- A. This section of the specification includes the provision and installation of the pneumatic tube system.
- B. Related Work
  - 1. Section 01010 - Furnished By Owner Items (FBO)
  - 2. Division 16: Electrical

**1.02 GENERAL REQUIREMENTS**

- A. The requirements of the Contract Documents, including the General and Supplementary General Condition and Division 1 - General Requirements shall apply to the work of this section.
- B. The specified Home Depot pneumatic tube system supplier shall furnish all pneumatic tube system equipment. Any additional non-factory related devices, accessories and utilities for the support and operation of the pneumatic tube system shall be provided by the general contractor and its electrical contractor.
- C. The general contractor shall coordinate all work as provided for in this section with all other related sections and trades. The general contractor shall contact and coordinate scheduling with the pneumatic tube supplier for installation.
- D. Changes to the pneumatic tube system or material quantities after receipt of Purchase Order by the pneumatic tube supplier shall be coordinated by the pneumatic tube supplier and Home Depot promptly upon receipt of revised plans. The pneumatic tube supplier shall submit associated change in materials and additional labor costs to the Home Depot project manager for approval.
- E. The entire installation shall meet latest applicable ordinances, codes and regulations of the installation locale.
- F. The owner shall provide and pay for all necessary licenses and permits.

**1.03 FBO PROCEDURES**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section. General requirements related to Furnished by Owner (FBO) Items are as defined in Section 01010. All FBO Forms listed below are included as part of Section 01010.
- B. Vendor Contact: Contractor shall send a completed "FBO Form A: Contractor Information Form" to the FBO vendor indicated below, twelve (12) weeks prior to the scheduled installation of the specified system:
  - 1. For ordering, scheduling, and installation contact:  
Aerocom Systems, Inc.  
Gina Todd – Sr. Project Manager  
678-513-9660 x672  
E-mail: [gtodd@aerocomusa.com](mailto:gtodd@aerocomusa.com)
  - 2. For all other issues contact:  
Aerocom Systems, Inc.  
Kevin Brown –Vice President  
678-513-9660 x667  
E-mail: [kbrown@aerocomusa.com](mailto:kbrown@aerocomusa.com)
- C. Take-Offs: FBO Vendor shall provide "take-offs" to the Contractor as specified in Section 01010. The Contractor shall then verify this "take-off" using an "FBO Form B: Take Off Conformation Sheet".
- D. Receipt of Shipment: Contractor shall verify shipment per the requirements of Section 01010 and complete the "FBO Form C: Confirmation of Shipment" and submit back to the FBO vendor.
- E. Request for Changes: Changes to materials and quantities after receipt of shipment shall be coordinated by the contractor with the FBO vendor per the requirements of Section 01010 using an "FBO Form D: Request For Additional/Replacement Materials".
- F. Return Merchandise Authorization Policy: The Home Depot will add to the contractors' scope of work the responsibility for coordinating (1) customer accommodation return request through the FBO Vendor. Requests shall be submitted using the "FBO Form E: Returned Materials" as specified is Section 01010.

**1.04 RESPONSIBILITIES**

**Construction Specification****(FBO) PNEUMATIC TUBE SYSTEM (AEROCOM)**

- A. The general contractor shall coordinate scheduling with the electrical contractor for the installation of conduit, power, electrical equipment, etc., for the pneumatic tube system.
- B. All conduit, power, switches, outlets, disconnects, boxes, fittings, couplings, connectors, straps, supports, pull strings, bushings, etc., shall be furnished and installed by the electrical contractor.
- C. The electrical contractor shall provide the pneumatic tube supplier with 120 v. dedicated, clean power with switch and outlet in the Vault Room and 208 v. 3 phase power with fused disconnect (20 amp FRN slow blow fuses) in the Money Pick-Up Room, in separate conduit, as shown on the Drawings.
- D. Pneumatic Tube System Carrier Safe is excluded from this scope of work. Carrier Safe is to be furnished by Home Depot and installed by the pneumatic tube supplier as shown on the Drawings. Home Depot's Carrier Safe supplier shall adapt its Safe to accommodate the pneumatic tube supplier's pneumatic tube system requirements.
- E. System operation, testing, turn over, warranty, compliance and after market service shall be provided by the pneumatic tube supplier.
- F. Provide the following pneumatic tube system equipment as indicated on the Drawings (Note: Quantity of equipment varies per prototype design):
  - 1. Aluminum Tube and Bends
  - 2. System Blower
  - 3. Vault Room Station
  - 4. Front End Stations
  - 5. Station Diverters
  - 6. Tube System Supports and Hangers
  - 7. Carriers per Front End Station
  - 8. System Controls and Software
- G. Any additional equipment and materials not indicated on the Drawings and added by state or local codes or authorities shall be immediately reported to the pneumatic tube supplier. The general contractor will provide additional equipment and materials deemed necessary.
- H. The pneumatic tube supplier shall install, terminate and test the pneumatic tube system until fully operational.

**1.05 SUBMITTALS TO CONTRACTOR**

- A. Provide 3 copies of an Owner's Operation and Maintenance Manual which shall contain operation, maintenance and repair instructions.

**1.06 QUALITY ASSURANCE**

- A. Manufacturer
  - 1. The equipment described in this section represents the function and type of materials required and herein specified. The equipment indicated in this section does not intend to be a complete list of all components required for an operational and approved system but only as guidelines. Additional equipment not herein specifically indicated but is a necessary part of an operational and approved system shall be provided as required.

**1.07 DELIVERY, STORAGE AND HANDLING**

- A. Equipment shall be shipped in appropriate shipping cartons, pallets, etc. as necessary.
- B. The pneumatic tube supplier is responsible for receiving the equipment at the job site. If the general contractor is not ready for installation as scheduled, the general contractor shall be responsible for proper and safe off loading and storage of pneumatic tube system materials.
- C. The General Contractor will provide access to an appropriate clean dry staging area as required in the building for material delivery, off loading and storage.

**1.08 SCHEDULING**

- A. (8) Weeks prior to Grand Opening all construction components that are to be furnished by General Contractor or others, need to be completed.
- B. Carrier safe (purchased by The Home Depot from others) needs to be on site prior to start of pneumatic tube system installation.
- C. Installation start date for the pneumatic tube system shall be as follows:

**Construction Specification****(FBO) PNEUMATIC TUBE SYSTEM (AEROCOM)**

1. Stores having less than (5) Front End Send/Receive Stations: (1) week prior to Turnover.
2. Stores having (5) or more Front End Send/Receive Stations: (2) weeks prior to Turnover.

Electrical contractor needs to be completed no later than the beginning of this week so that pneumatic tube system installer may initiate start-up and tune & test system components for proper operation.

D. Substantial completion shall be as follows:

1. Stores having less than (5) Front End Send/Receive Stations: (5) working business days.
2. Stores having (5) or more Front End Send/Receive Stations: (10) working business days.

## 1.09 WARRANTY

- A. Guarantee all equipment and workmanship to be free from inherent mechanical or system defects for two (2) years from date of grand opening.
- B. For service or warranty calls:

800-741-5096  
 Aerocom Systems, Inc.  
 Melissa Edwards – Service Manager  
 678-513-9660 x685  
 678-513-9675  
 Fax: 770-965-9141  
 E-mail: melissa@aerocomusa.com

The following information is required:

Store #  
 Store Location  
 Contact Person  
 Phone #  
 Problem Description  
 Home Depot Work Order #

All warranty calls are at no charge.

## PART 2 - PRODUCTS

### 2.01 NATIONAL ACCOUNT ARRANGEMENT

- A. The Home Depot has National Account arrangements for the supply of pneumatic tube equipment. The Home Depot will accept only products procured through these companies. Information on the pre-established pricing and the procedure for securing the name of the factory authorized representative must be obtained by contacting the following Sales Managers:

### 2.02 ACCEPTABLE MANUFACTURERS

- A. Aerocom Systems, Inc. Contact: Gina Todd, Sr. Project Manager (678) 513-9660 or Ron Miller, Vice President 678-513-9660.

### 2.03 GENERAL SYSTEM DESCRIPTION

- A. The System shall consist of transmission tubing, diverters, stations, air power unit, central control, and carriers.
- B. Transmission tubing shall be arranged into a two-way reversing single line consisting of a trunk line, feeder lines interconnected by diverters handling one carrier at a time and forming the most effective carrier routing consistent with the number and location of stations.
- C. Stations shall be located in the following areas as shown on the drawings, with service as follows:  
 VAULT ROOM TO AND FROM FRONT END REGISTERS (number of registers as specified in drawings)  
 Each Front End Register Station shall be capable of Sending To AND Receiving From the Vault Room Station.
- D. Carrier transmission is accomplished by a central power unit which shifts between vacuum and pressure operating modes. The central power unit shall be freestanding type which is located in the Money Pick-Up Room adjacent to the Vault Room. The System is designed for operation only while a carrier is in transit between stations, and when carriers have been queued for dispatch, all controlled by the PC computer. The System is designed to transport one carrier per operating cycle at an average speed of 25 feet per second.

**Construction Specification****(FBO) PNEUMATIC TUBE SYSTEM (AEROCOM)**

- E. To dispatch a Carrier from a Register Station, open the Station Door and place the Carrier on the Station Pad. Close and latch the Station Door, then Depress the Send Pushbutton on the front of the Station. Vacuum will then propel the carrier to the Central Vault Station, after which the system will automatically turn off. If the System is in use when a dispatch is desired, the Cashier may still initiate a transaction as described above, and the System Computer will automatically dispatch the Carrier when the current transaction has completed.
- F. To dispatch a Carrier from the Central Vault Station, open the Vault Station Door and place the Carrier on the Station Pad. Close and latch the Station Door, select the desired Register Station from the destination menu on the Computer Monitor using the arrow keys, then press Enter. The Power Unit will dispatch the Carrier on pressure to the Register Station and will then automatically turn off. The Real-Time details of the transaction are displayed on the Computer Monitor and are fully viewable by Vault Personnel during the transaction.
- G. All Register Stations are down-delivery full-access type, complete with a polycarbonate door. All Register Stations are key lockable and have an integral Send Pushbutton and Indicator Lights. Register Stations can be wall, floor or counter mounted, and must maintain a clean appearance throughout.
- H. An Air Power Unit shall be provided supplying air in the vacuum or pressure mode automatically, as required.
- I. The Safe Pneumatic Tube System is fully expandable with the addition of Diverters and Stations without requiring replacement of existing equipment or control software.

**2.04 SYSTEM OPERATION**

- A. A carrier shall be prepared for dispatch from a station by placing the carrier into the sending unit, selecting the destination and activating the dispatch function, allowing the carrier to enter the system.
- B. The dispatch carrier shall be moved to its destination by negative or positive air pressure through the tubing network at an average speed up to 25 FPS.
- C. An inoperative terminal shall not affect the normal functioning of any other terminal.
- D. The System shall be capable of transferring a five-pound payload, including the weight of the carrier.

**2.05 TRANSMISSION TUBING**

- A. Transmission tubing and bends shall be specially manufactured for pneumatic carrier transmission, fabricated of heavy-duty, chemically washed 4" O.D. 16 gauge continuous welded Aluminum, manufactured to ASTM-B313 and ANSI H35.1 standards, H-26 tempered for maximum resistance to oxidation and corrosion for indoor or outdoor installation.
- B. Each 20 ft. full straight length of tubing shall have one expanded end for pressure-fit joints. Tubing joints shall be either solid or clamp type sleeves and shall be airtight.
- C. Bends shall be formed on the centerline to a minimum 36" radius, commensurate with carrier type and size and shall be of a true circular cross section throughout and free from wrinkles or distortions.
- D. Tubing shall be securely held in place, and shall be braced against motion caused by the passage of carriers.
- E. Tubing hangers shall be plated or painted clamps and threaded rods attached to suitable anchors. Horizontal tubing shall be supported at each bend or each length of straight tubing and vertical tubing shall be supported at each floor and/or 8 foot centers between each floor.
- F. Each diverter and each bend shall be supported at each end. Unfinished structural channel, angle iron, or preformed channel may be used to support parallel and close together groups of tubing. Strapping of tube directly to structural members or other piping shall not be acceptable.

**2.06 STATION TERMINALS**

- A. Register Stations – (send/receive)

**Construction Specification****(FBO) PNEUMATIC TUBE SYSTEM (AEROCOM)**

1. The Register Stations shall be send/receive type constructed of heavy-duty steel with a washable, wear resistant, protective powder coat finish. An impact-absorbing pad shall be built into each terminal to cushion the carrier's delivery.
2. Register Station Doors shall be impact resistant transparent polycarbonate material. The transparent doors shall visually indicate the presence of carriers. All doors shall be equipped with a positive action pull-tight lockable latch, and door hinge.
3. Delivery-control air diodes shall be provided at each station terminal location to insure an air-cushioned soft delivery of carriers. The air diodes shall be designed to open when sending a carrier to allow for free flow of air, and close when receiving a carrier to check airflow.
4. All Register Stations shall be provided with "Send" and "In-Use" lights that illuminate whenever a carrier is in transit. A second illuminated pilot shall be provided at each station terminal that shall illuminate to indicate the arrival of a carrier at that particular Station. Removal of the carrier will extinguish the arrival light.
5. A thru beam infrared optic will signal carrier presence to the System Software.

B. The Vault Station – (send/receive)

1. The Vault Station shall be of the same construction, materials and design as the Register Station, with the addition of an industrial duty positive locking handle.

## 2.07 DIVERTERS

- A. All required Station Diverters shall be one-in, four-outlet type, wired for 24 volt DC power.
- B. The diverters shall be provided with (1) full length secured access panel to facilitate maintenance in the field. Tubing within the diverters shall be rigid. Offset tubing within the diverters shall be formed of clear polycarbonate for visual inspection of carrier blockages with bend radius sufficient to allow unobstructed carrier passage in either direction through the diverter. Joints of each tubing segment shall be suitably sealed. No flexible tubing shall be used.
- C. Each diverter shall be provided with mounting braces having appropriate holes to properly accept 3/8" diameter threaded hanger rods, for direct support and bracing.
- D. Each diverter shall be controlled through solid state control circuitry.
- E. Diverters and controls shall be designed to permit convenient removal for maintenance and/or replacement.

## 2.08 CENTRAL AIR POWER UNIT

- A. The central air power unit shall be free standing type located in the Cash Pick-Up Room adjacent to the Vault Room. The central power unit shall consist of one blower, air shifting mechanism and control panel.
- B. One three-phase blower shall be supplied that operates on 208 volt AC 60 Hz three phase power for increased efficiency and economy. The Blower shall be in the off mode except when system is in use. Blower shall be designed to move sufficient volume of air at vacuum/pressure required to propel a loaded carrier (2.5 lb. payload capacity) through a 1200' system at an average speed of approximately 25 feet per second. Blower shall be fully enclosed TEFC. The blower shall always run in the same direction. Flow-through, integral motor-drive blowers shall not be acceptable.
- C. The air shifting mechanism shall consist of a vertically mounted diverter unit complete with rotary motor. Air shifting mechanism shall alternate between four (4) positions to allow for vacuum neutral or pressure throughout the system, as appropriate to propel the carrier to its proper destination. When the gate is in position 1, the system will operate on pressure and when in position 2, the system will operate on vacuum without reversing rotation of the blower. The air shifting mechanism shall be electrically controlled by the System Software and shall automatically adjust to the proper position.
- D. The central air power unit shall be controlled through the main system control.
- E. Air piping shall connect the central air power unit with the system.

## 2.09 CARRIERS

- A. Provide three (3) carriers per Register Station.
- B. Carriers shall be end-opening type and be designed for bi-directional travel. Carriers shall have an inside diameter of not less than 3", and shall be available in usable inside lengths ranging from 8" to 12". Carrier bodies shall be transparent polycarbonate material, with durable molded polycarbonate/ABS end cups - one closed end, and one open end fitted with polyurethane strap-hinged rubber cover and elastic tab fastener to hold cover securely closed. End cups shall be fitted with replaceable wear bands sized to provide an air seal and to sound-deaden carrier travel through the Tubing.

## 2.10 AEROCOM SYSTEM

- A. Central control

**Construction Specification****(FBO) PNEUMATIC TUBE SYSTEM (AEROCOM)**

1. System operations shall be controlled by a microprocessor central control unit (MPC) integral with the master station controls and shall be capable of handling up to 61 stations of single line reversing service on a single zone. The central control shall perform all logic and control functions and provide permanent storage for the system operating program.
2. Interface controls shall communicate operating data to and from the stations, diverters and APU, enabling MPC to supervise and command system operation from the master station to and from the substations. Controls shall be modular, using solid state component. For ease of maintenance and service, the circuit module shall be readily removable.
3. The MPC unit shall have these capabilities:
  - a. Supervise carrier dispatch, travel and arrival functions ensuring a carrier leaves a station at the earliest possible moment and takes the shortest possible route to its destination.
  - b. Communicate continually with all system components.
  - c. Command and exercise the operations of system components.
  - d. System purge - will clear the system of all traffic upon command.
  - e. Shut down individual stations on an as-required basis.
  - f. Auto power down to minimize energy usage by shutting down the APU when there are no transmissions and reactivate the APU on command.
  - g. Interface with system printer for constant hard-copy record of transactions and other activities.
  - h. Monitor systems alarms and record on MPS station display and printer.
  - i. Operate system diagnostic routine by displaying requested information. By means of keypad operation, the MPC may command system devices to perform certain actions related to maintenance and service. All devices shall be capable of confirming their function back to central control.
4. Power packs shall be provided to supply 24 VDC control power as required throughout the system.
5. Low-voltage control cable shall be furnished between the power pack(s), central control, diverter and stations. The control cable will be strapped directly to the pneumatic tubing.

**B. Printer**

1. The printer and MPC (2.07) shall be in the vault. The printer shall record all alarms, and when so commanded, record the operation of the system and provide hard copy record of system transactions. The printer shall be controlled by the MPC to run only when required.
2. The standard data presentation shall be:
  - a. Day and date
  - b. Time mark each hour (real time)
  - c. Time of dispatch and arrival of each carrier, the point of origin and destination
  - d. Carrier traffic count
  - e. System alarms by transaction status - send, receive, or in transit
  - f. After alarm received - the record of the carrier location, air flow mode when carrier last detected and unit causing alarm.
  - g. Display of specific listings of system components status

**PART 3 - EXECUTION****3.01 PREPARATION**

- A. Prior to starting installation work, building conditions shall be inspected to verify that the pneumatic tube system may be installed in accordance with shop drawings.
- B. Any delay of the pneumatic tube system installation due to failure of the General Contractor to provide sufficient acceptable work areas for the pneumatic tube system installation, or failure to complete any required work prior to pneumatic tube system installation, or any damage to the pneumatic tube system by other trades, will result in a change order for additional costs incurred.
- C. The general contractor shall coordinate the work in this Section with all related trades. Work and/or equipment provided in other Sections and related to the pneumatic tube system shall include, but not be limited to:
  1. The General Contractor will insure that all related construction components have been completed including completion of ALL of the concrete flooring poured (including outside garden), structural steel and joists installed, roofs and garden canopy and enclosures complete, Vault Room and Tool Rental Center walls erected, all electrical power and components installed and operational, all front end Register Stands, Desks, walls, enclosures and supports installed, all inspected and available for pneumatic tube system installation prior to requesting the pneumatic tube system installation, to ensure an uninterrupted installation.
  2. All Register Check Out Stands must be installed in place.
  3. Garden pad must be poured, Roof/Canopy must be installed and Register Can/Kiosk must be installed in place.
  4. Special Service Area, Pro Desk, Returns and Tool Rental must be fully installed in place.
  5. Electrical Power (120 v. dedicated, clean power with switch and outlet) must be installed and operable in Vault Room. Electrical Power (3 phase 208 v. with fused disconnect) must be installed and operable in Money Pickup Room.
  6. Electrical contractor to coordinate with pneumatic tube system installer on the placement and location of conduits, power and equipment for the 120 v. power, outlet and switch, and 208 v. power and disconnect.
  7. Electrical Power and equipment requirements, locations, etc. are to be shown on Architect's Drawings.

**Construction Specification****(FBO) PNEUMATIC TUBE SYSTEM (AEROCOM)**

8. If the key tumbler is installed in the door for the Money Pickup Room, a key must be readily accessible to permit access by the pneumatic tube system installers.
  9. Carrier Safe from EXL Safe must be delivered damage free, prior to tube system installation start date.
  10. Personnel properly authorized by The Home Depot must be on-site to verify Station Locations.
  11. Personnel properly authorized by The Home Depot must be on-site for System Training upon installation completion.
  12. Personnel properly authorized by The Home Depot must be on-site for System Inspection and Sign-Off upon installation completion.
  13. Sufficient time must be allowed in the Critical Path between Pneumatic Tube System Installation Start date and Pneumatic Tube System Installation Completion date.
- D. The owner's representative shall be notified at once of any discrepancy and installation in the areas involved shall not be undertaken until action regarding discrepancies has been decided.

**3.02 INSTALLATION**

- A. Field cut tubing and bends shall be joined with galvanized electric welded steel pressure fit couplings of proper dimensions to produce an airtight connection. When bends are cut in the field for offsets and small angle turns, the ends shall be cut square and straightened out by mandrilling to make a smooth connection to the adjoining piece. Register Stations and Diverters shall be connected to Tubing using mechanical bolted couplings for ease of replacement and maintenance.
- B. All pressure joints shall be sealed with a high strength, medium viscosity aluminum colored, synthetic rubber based industrial metal sealant to insure airtight connections throughout. Mechanical joints shall be sealed with high strength air-tight tape prior to installation of the Coupling.
- C. Fittings shall be fabricated steel with the inside milled to fit snugly on the Tubing. Provide necessary elbows, tees, couplings, sleeves, and other fittings required for proper installation of the systems.
- D. Tubing and Bends shall be installed and secured with double rod clamps constructed of 1" x 1/8" cold rolled flat bar steel held together by (2) 5/16" diameter threaded, zinc plated hanger rods. Single Rod type hangers may also be used when Tubing is supported close to bar joists. Clamps shall be spaced on approximately 10 foot centers, and shall not have scoring or break joints to weaken their cross sectional area. Sway bracing shall be used at the top of each Register Station riser, at each Diverter and elsewhere as required to prevent movement from the passage of carriers.

**3.03 CLEANING**

- A. The Contractor's installation personnel shall organize their work and maintain orderly/clean conditions relating to the installation.

**3.04 INSPECTION**

- A. When the Contractor presents the system to the Owner for test, both shall immediately appoint a representative to examine workmanship and material, and test the system for operation compliance to the specifications.
- B. A certificate will be presented to the owner's representative upon completion for verification the system is operational and complete.
- C. The Owner shall appoint a representative to accompany the Contractor's representative during the tune-up test period. During this period, the manufacturer shall instruct the Owner's representative in the operation and maintenance of the system. The Owner's representative shall train all additional personnel in the operation of the system.

**END OF SECTION**

**Construction Specification****MECHANICAL GENERAL REQUIREMENTS****PART 1 - GENERAL****1.01 RELATED DOCUMENTS**

- A. Refer to the General Conditions.

**1.02 DESCRIPTION OF WORK**

- A. Work described in these specifications and shown on the accompanying drawings includes furnishing all parts, labor, equipment, materials, utilities, appliances and supervision required to provide a complete project.

**1.03 RELATED WORK**

- A. The following work is included in this contract, to the extent required for installation work.
  - 1. Cutting and repairing of walls, floors and ceilings.
  - 2. Electric power and control wiring for equipment installed.
  - 3. Starters, thermal overload switches, remote push button stations, remote pilot light stations, thermostats and other control items shown on the plans which relate to or are required for the mechanical systems shall be furnished by the Mechanical Contractor or Owner and installed and wired by the Electrical Contractor or Energy Management Controls Contractor as defined in the contract documents and drawings.
- B. Related Work specified elsewhere includes but not limited to:
  - 1. Section 15960 - Energy Management Controls and Commissioning

**1.04 SCOPE**

- A. Furnish and install complete Heating, Ventilating and Air Conditioning systems as described in the drawings, including but not limited to the following:
  - 1. Roof-top gas-electric packaged air conditioning units.
    - a. Roof-mounted evaporative coolers and gravity relief vents.
    - b. Roof-mounted, gas-fired make-up air units
  - 2. Roof-top gas-electric and electric-only DX air conditioning units.
  - 3. Gas-fired and electric unit heaters.
    - a. Gas-fired radiant heaters.
  - 4. Roof-mounted, wall-mounted and in-line exhaust fan systems as applicable.
  - 5. Supply, return, and exhaust diffusers, grilles and registers.
  - 6. Ductwork and dampers
  - 7. Controls (No Digital Thermostats).
  - 8. Duct insulation.
  - 9. Air balancing.
  - 10. Shop drawings.
  - 11. Record drawings.
  - 12. Maintenance manuals.
  - 13. Guarantee.
  - 14. Startup per manufacturer's recommendations.

**1.05 INVESTIGATION**

- A. Before submitting bids, each Bidder shall familiarize himself with the conditions under which he will be required to operate in performing his part of the Contract. No allowance will be made subsequently to the Contractor for any error due to his negligence in failing to comply with the above.

**1.06 PERMITS, FEES AND NOTICES**

- A. Secure and pay for permits, governmental fees and licenses necessary for the proper execution and completion of the Mechanical Work.

**1.07 CODES & REGULATIONS**

- A. All work shall comply with all local, state and federal codes, ordinances and regulations.
- B. Codes cited represent minimum requirements. Express requirements of the documents may be in excess of those minimums.
- C. The following industry standards, specifications and codes are minimum requirements:
  - 1. Owner's Insurance Underwriters Requirements
  - 2. Underwriter's Laboratories, Inc. Standards (U.L.)
  - 3. American Standards Association (A.S.A.)



**Construction Specification****MECHANICAL GENERAL REQUIREMENTS**

4. American Society for Testing Materials Standards (A.S.T.M.)
5. National Fire Protection Association Pamphlets (N.F.P.A.)
6. National Electrical Code (N.E.C.)
7. American Society of Mechanical Engineers Boiler and Pressure Vessel Codes (A.S.M.E.)
8. Local & State Plumbing Code
9. Local & State Mechanical Code
10. Local & State Building Code
11. Applicable Municipal, County and State Sanitary Codes, Laws and Ordinances
12. Standards and Requirements of Local Utility Company Concerned
13. State Fire Marshall Regulations
14. Sheet Metal and Air Conditioning Contractors/National Association Standards (S.M.A.C.N.A.)
15. Life Safety Code
16. Local, State and Federal Handicap Accessibility Codes
17. Code for Energy Conservation in New Building Construction
18. Occupational Safety and Health Act
19. American Society of Heating, Refrigerating and Air Conditioning Engineers Standards (A.S.H.R.A.E.)
20. Air Movement and Control Association (A.M.C.A.)
21. Air Conditioning and Refrigeration Institute Standards (A.R.I.)

**1.08 DRAWINGS AND SPECIFICATIONS**

- A. The drawings are essentially diagrammatic to the extent that all offsets, bends, and special fittings, etc., are not exactly located.
- B. The Architect of Record's interpretation of the drawings and specifications will be final.
- C. The drawings and specifications are complementary. Any work called for on the drawings and not mentioned in the specifications, or vice versa, shall be performed as though fully set forth in both.
- D. Should there appear to be an error or discrepancy in or between the drawings and specifications, the Contractor shall refer the matter to the Architect of Record for adjustment before proceeding with the work. Should the Contractor proceed with the work without so referring the matter, he does so on his own responsibility and at his own expense.

**1.09 SUBMITTALS TO CONTRACTOR**

- A. All submittals shall conform to the requirements of Section 01300 – Submittals.
- B. Prepare shop drawing submittals with identification by specification section and article. Clearly mark the particular make, model number, accessories and options.
- C. Submit the following data to the Contractor as they apply to this project:
  1. Pipe insulation
  2. Diffusers, Registers, Grilles and Dampers
  3. Pre-fabricated fittings
  4. Water Heaters
  5. Plumbing fixtures and trim
  6. Floor and roof drains.
  7. Hydrants and hose bibbs
  8. Cleanouts and covers
  9. Valves
  10. Shock Arresters
  11. Carriers
  12. Vacuum Breakers
  13. Temperature and Pressure Relief valves
  14. Backflow Preventers (where called for)
  15. Booster Pumps (where called for)
  16. Hangers and Attachments
  17. Piping Material
  18. Manufactured Structural Roof Curbs (Section 07720)
  19. HVAC Insulation (Section 15250)
  20. Unit Heaters (Section 15610)
  21. High Intensity Radiant Heaters (Section 15620)
  22. Low Intensity Radiant Heaters (Section 15625)
  23. Rooftop Units (Section 15730)
  24. Fans (Section 15850)
  25. Energy Management Controls and Commissioning (Section 15960)

**Construction Specification****MECHANICAL GENERAL REQUIREMENTS**

- D. Submit the following data and shop drawings to the Contractor as they apply to this project:
  - 1. Maintenance and Operating Instructions for all equipments.
  - 2. Certification of operation and maintenance instructions to the Owner's representative.
  - 3. As-Built Drawings.
  - 4. Test and Balance report (See Section 15990)
- E. Capacities, rating and characteristics of the proposed equipment shall be based on conditions indicated or specified herein. Any deviations in ratings or dimensions from specified equipment shall be noted in red. Engineers' review of shop drawings is for general conformance with the design concept and contract documents.
- F. All substituted materials and equipment, which the Contractor proposes to furnish, shall be submitted for review within 30 days after the contract has been let. Data shall be complete in all respects and shall be referenced, where applicable, to the unit symbol utilized on the Drawings and Specifications. Shop drawings will be reviewed and returned by the Architect within five (5) working days.
- G. IF SUBMITTAL DATA ARE NOT RECEIVED WITHIN THE SPECIFIED TIME, THE CONTRACTOR SHALL FURNISH ALL EQUIPMENT EXACTLY AS SHOWN.
- H. Submittal review is considered as general compliance of the basic applicability of the substituted equipment. Contractor shall be responsible for the installation of the equipment within a given space. If the Contractor uses substituted equipment, he shall be responsible for producing his own coordinated work drawings, which depict the substituted equipment accommodated in the space. Where the substituted equipment creates the need for alterations in any portion of the work depicted in the contract documents, it shall be the Contractor's responsibility to notify all of the affected parties and coordinate these items with all other trades. Further, it shall be the contractor's responsibility to assume any additional cost to the contract created by the substituted equipment.
- I. Substituted equipment is considered to be any equipment other than the named item on the Drawings.
- J. If deviations, discrepancies or conflicts between Shop Drawings and Specifications are discovered either prior to or after Shop Drawings Submittals are processed by the Engineer, the design Drawings and Specifications shall control and shall be followed. Review of submittal data shall in no way relieve the Contractor of his duty to perform all work and provide all equipment in strict compliance with the requirements set forth on the drawings herein.
- K. Failure to mark submittals in accordance with the above format will be considered due cause for rejection of shop drawings. See 15010, item 1.07C.

**1.10 CUTTING AND REPAIRING**

- A. Contractor shall perform all cutting and repairing as required for and incidental to installation of the mechanical work.
- B. Where cutting and patching is required due to defective or ill-timed work under this Division, Contractor shall pay the cost for cutting and patching.

**1.11 PAINTING**

- A. Clean surfaces of work under this Division and leave surfaces ready for painting.
- B. Where surfaces of factory finished items are marred, refinish those surfaces to original condition. No evidence of rusting panels or fasteners will be accepted.
- C. The Contractor shall be responsible and shall pay for painting of all visible surfaces behind grilles, registers, and diffusers flat black.

**1.12 COORDINATION OF INSTALLATION**

- A. Install work to fit into the spaces provided in the building. Avoid damage on account of ill-timed work.
- B. Except where otherwise noted, arrange piping to run symmetrically, either parallel or normal to building lines, and true to grade.
- C. Arrange parts of work requiring normal service to be readily accessible.
- D. Provide supports and anchors for work to avoid damage from movement.
- E. Coordinate work under this Division with work under other Divisions.

**1.13 PROTECTION OF WORK DURING CONSTRUCTION**

- A. Provide protective covers, skids, plugs, caps and coating to protect equipment and materials from damage and deterioration during construction.

**Construction Specification****MECHANICAL GENERAL REQUIREMENTS**

- B. Store equipment and material under cover and off the ground.
- C. When outdoor storage is necessary, provide protective covers of sheet plastic of gauge suitable for the area involved and reinforced to withstand wind and precipitation. Set equipment and material on skids or platforms of height sufficient to avoid deterioration from spattering and groundwater.
- D. Plug ends of pipes when work is stopped to prevent debris from entering the pipes.
- E. Do not operate any air handling units during the construction period without filters in place to filter air entering the fan. Refer to Rooftop Unit specifications for filter requirements.

**1.14 CLOSING-IN OF UNINSPECTED WORK**

- A. Contractor shall not allow or cause any of the work to be covered up or enclosed until it has been inspected, tested, and approved by the Engineer and the local inspector. Should any of his work be covered up or enclosed before such inspection and test, he shall, at his own expense, uncover the work and, after it has been inspected, tested and approved, make all repairs with such materials as may be necessary to restore all his work and that of the other trades to its original and proper condition.

**1.15 DAMAGE BY LEAKS**

- A. Contractor shall be responsible for all damage to any part of the premises caused by rain leaks through or around ducts, equipment or fixtures furnished and/or installed by him for a period of one year from the date of acceptance of the work by the Owner.

**1.16 CONCRETE WORK**

- A. Concrete work for equipment pads, pipe anchors, pumps, supports, etc., will be provided under other sections of the work. All sleeves, templates, anchor bolts, and information pertaining to the specific equipment requirements shall be provided under this section of the specifications.

**1.17 PLUMBING CONNECTIONS**

- A. Refer to Section 15400 for gas connections, coil condensate lines and equipment drains, except as noted herein.

**1.18 ELECTRICAL WORK**

- A. Supply instruction to the electrical contractor for running all conduit, installing power wiring and making the line electrical connections. Mechanical Contractor shall be responsible for the operation of the equipment furnished under this section of the work.
- B. Electrical contractor shall provide the line and low voltage electrical work and control conduits; however, any required control wiring not shown on the control diagram shall be provided under this section. In the event that the Contractor chooses to provide equipment, which requires additional expense for power or control wiring, he shall pay all additional electrical cost.

**1.19 MAINTENANCE DATA**

- A. Furnish and deliver to the Engineer for approval, three (3) manuals covering details of operation and maintenance for all apparatus requiring service including:
  - 1. Telephone number of the installing Contractor's Service Department.
  - 2. Manufacturer's operating and maintenance manuals, including parts lists, for each piece of equipment and accessory requiring service or maintenance and the name, address and phone number of the nearest sales and service organization for each item.
  - 3. Step-by-step procedure for starting and stopping each system.
  - 4. Control diagrams.
  - 5. Valve lists and diagrams.
  - 6. Copies of each inspection certificate issued.
  - 7. Copies of all manufacturer's equipment warranties.
  - 8. Equipment electrical wiring diagrams.
  - 9. Equipment lubrication schedule.

**1.20 CLEANING UP**

- A. Remove all stickers, rust, stains, labels and temporary covers before final acceptance.
- B. Blow, vacuum, or flush foreign matter from piping, pumps, fans, motors, devices, switches, panels and equipment.
- C. Clean identification plates on equipment of excess paint and polish bright.

**Construction Specification****MECHANICAL GENERAL REQUIREMENTS****1.21 ACCESS DOORS**

- A. Furnish access doors in all walls and ceilings as required for the operation, maintenance, and replacement of all valves, cleanouts and shock arresters in connection with this Work.
- B. Deliver, to the General Contractor, these doors for setting "Under Another Section", along with a prepared list giving sizes and locations of doors to be installed for this Work.
- C. Arrange valves in such a way to keep the size and number of required doors at a minimum and group valves so that one door can serve more than one valve where possible.
- D. Access doors shall be of adequate size to properly service or replace valves and cleanouts and shall be not less than 12" x 12".
- E. Access doors shall be of heavy steel plate construction. The frame and doors shall be flush with finished wall or ceiling with concealed hinge and with only a narrow border of frame exposed. The locking or fastening device shall be flush operating. Doors shall be Jiffy, Karp Associates or Colombia Metal Box Co. Where acoustical ceilings occur, door shall be special pay type door, except where acoustical ceiling is removable pan type. Doors shall be given a prime coat of paint inside and out.

**1.22 AS-BUILT DRAWINGS**

- A. As project mechanical work progresses, Contractor shall record on one (1) print set of mechanical drawings, under floor plumbing and sprinkler lines, all changes and deviations from the Contract Drawings in size, location, arrangement, etc., of all piping, valves, thermostats, equipment, etc., by size and location (scale to wall). Make sufficient field measurements to accurately locate all equipment. This copy shall be left in Electrical Room.
- B. Contractor shall turn this data over to the Architect of Record upon final job acceptance.

**1.23 STARTUP AND COMMISSIONING**

- A. Refer to Section 15960 - Energy Management Controls and Commissioning

**1.24 APPROVAL**

- A. All work specified under this Division shall be done by skilled mechanics and subject to the inspection and final approval of the Architect of Record and the EMS Controls Contractor. The General Contractor is responsible to verify the qualifications of the EMS Controls Contractor. Such final approval shall in no way relieve the Contractor from responsibility for defects in either workmanship or material, which may be subsequently developed.

**1.25 GUARANTEE / WARRANTY AND SERVICE**

- A. The Contractor shall guarantee and service the entire installation for a period of one (1) year from the date of final acceptance of the installation by the Owner. Warranty for all labor and coordination of repair parts is required on all Mechanical Equipment, regardless if purchased by Owner, (FBO), or by Mechanical Contractor.
- B. The Contractor shall, during the period of guarantee, replace or repair at his own expense any piece of equipment and/or material, which is found to be defective. The replacement or repair shall be performed the same day of notification in an emergency fashion when notified by the Owner or authorized representative. The Contractor shall also repair all damage to surrounding work caused by the failure, repair, or replacement of defective equipment.
- C. The final acceptance will be made after the Contractor has adjusted his equipment, balanced the various systems, demonstrated that it fulfills the requirements of the drawings and specifications, and has furnished all the required certifications of inspection and approvals.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

**Construction Specification****BASIC MATERIALS AND METHODS****PART 1 - GENERAL****1.01 GENERAL REQUIREMENTS**

- A. Refer to General Conditions.

**PART 2 - PRODUCTS****2.01 MOTORS AND STARTERS**

- A. Furnish motors, starters, thermal overload switches, push button stations and contactors for equipment covered herein unless otherwise specified. Wiring of starters, push button stations, thermal overload switches and contactors not factory installed, is specified under Division 16, ELECTRICAL.
- B. Integral HP motors for general purpose application indoors, except where otherwise specified: Ball bearing type in drip proof frame, with Class B insulation for 80 degrees C rise over 40 degrees C ambient at 1.15 service factor, designed to NEMA Design B for normal starting torque.
- C. Match motor to equipment so that motor current drawn from lines will not exceed nameplate full load amperage.
- D. Provide overload protection for all hot lines in starters with three (3) overload relays for 3-phase motors and one (1) overload relay for 120 volt, 1-phase motors, and two (2) overload relays for 208 volt, 1-phase motors.
- E. Unless otherwise specified, provide for each motor ½ HP and larger a standard magnetic starter in NEMA #1 enclosure, Allen-Bradley Bulletin 709, providing overload and low voltage protection.
- F. Provide Hand-Off-Auto switch mounted on the face of each starter.
- G. Provide 120 volt holding coil control circuits in magnetic starters and contactors. For service in power systems with 120 volts available at disconnecting means, take control power from line. For service in other power systems, provide control power transformer from line voltage from control voltage. Arrange control power transformers with: Primary broken through disconnect device; secondary grounded on one leg, fused on other and control device contacts in fused leg. Where not all voltages within a cubicle will be interrupted by opening the disconnecting means, provide warning sign **"DANGER, CONTROL CIRCUITS HOT"**.
- H. Unless otherwise specified, provide for each single-phase motor a manual starting switch with thermal overload protection with Hand-Off-Auto selector switch.
- I. Starters and contactors not furnished with equipment shall be manufactured by one of the following: Allen-Bradley, Arrow-Hart, Cutler-Hammer, Furnas, General Electric, Square D, Wagner, or Westinghouse.
- J. Motors exposed to weather or moist atmosphere shall have splash-proof and epoxy encapsulated enclosures unless otherwise specified.
- K. Refer to Electrical Drawings for voltage characteristics supplied to all mechanical equipment. Electrical connections to motors, starters and resistance heaters shall match the wiring provided under Division 16, ELECTRICAL and indicated on Electrical Drawings.
- L. Equipment furnished with factory-installed motor starter units shall also be equipped with individual motor branch circuit protective devices interconnected on their line sides to lugs sized to receive a feeder with a minimum ampacity of 125% of total connected load.
- M. Motors not furnished with equipment shall be manufactured by Allis-Chalmers, Century, Delco, General Electric, Ideal, Louis-Allis, Wagner or Westinghouse.
- N. Unless otherwise specified, provide for each motor smaller than ½ HP, a manual starting switch with thermal overload protection with pilot light and stainless steel coverplate equal to Square D 2500 Series. Switches installed on finished walls shall be flush type.
- O. Coordinate all mechanical equipment requirements, including any control and interlock requirements, with work in Division 16.

**2.02 BELT DRIVES**

- A. V-belt drives shall be rated at not less than 150% of nominal motor horsepower.
- B. Motor sheaves shall be variable pitch type.
- C. Scheduled fan static pressures are estimated. Provide and adjust drives to deliver scheduled air quantities against actual system resistance.

**Construction Specification****BASIC MATERIALS AND METHODS**

- D. Provide guards for all belt drives not enclosed within equipment housings. Belt guards for double inlet fans shall be expanded metal. Provide openings in guards at driving and driven sheaves for use of revolution counter.

**2.03 FLASHING**

- A. Provide flashing for piping and ductwork passing through exterior walls or roof.
- B. Ductwork wall and roof penetrations subject to outdoor weather shall be caulked and flashed for a completely water-tight assembly.
- C. Flashing shall be 20 gauge galvanized steel or heavier, or equivalent aluminum sheeting.

**2.04 EQUIPMENT IDENTIFICATION**

- A. Provide labels for each starter and control switch. Labels shall have 1/4" high white cut letters; secure to starter or switch.
- B. Provide all equipment with labels using 1-1/2" high white cut letters. All equipment labels shall be engraved, laminated, bakelite with white cut letters. Secure labels with General Electric RTV-106 adhesive.

**2.05 ESCUTCHEONS**

- A. Provide escutcheons on exposed piping passing through walls, floors and ceilings in finished areas, chromium-plated, not less than 20 gauge steel, Grinnel Fig. 10, sized to fit over insulation and to cover sleeves. Where sleeves extend above floor finish, provide Grinnel Fig. 400.

**PART 3 - EXECUTION****3.01 LUBRICATION**

- A. Lubricate each item of apparatus requiring lubrication prior to start-up. Perform all lubrication in accordance with the manufacturer's recommendation. Prepare a lubrication chart listing for each piece of equipment:
  - 1. Points requiring lubrication.
  - 2. Schedule of recommendations for one manufacturer's products with brand name and designation.
  - 3. Frequency of lubrication required.

**3.02 EQUIPMENT SUPPORTS**

- A. Equipment supports for suspended equipment shall be provided by Contractor. Provide details for approval before fabrication and erection.

END OF SECTION

**Construction Specification****SUPPORTS AND ANCHORS****PART 1 - GENERAL****1.01 WORK INCLUDED**

- A. Work described in this section includes:
1. Pipe, duct and equipment hangers, supports and associated anchors.
  2. Equipment bases and supports.
  3. Sleeves and seals.
  4. Flashing and sealing equipment and pipe stacks.

**1.02 REFERENCES**

- A. NFPA 13 - Standard for the installation of Sprinkler Systems.

**1.03 QUALITY ASSURANCE**

- A. Supports for the Sprinkler Piping: In conformance with NFPA 13.

**PART 2 - PRODUCTS****2.01 PIPE HANGERS AND SUPPORTS**

- A. Plumbing piping underground shall be firmly bedded on solid ground on the body of the pipe. Block cast iron water pipe with concrete to undisturbed earth to prevent blowing out joints. Provide the rods for all outside joints.
- B. Support soil and vent stacks and inside downspouts with iron riser clamps at each floor.
- C. Vertical pipe subject to movement shall be supported from wall by means of pipe clamp, Fee & Mason #366.
- D. Support domestic hot and cold water piping in spaces behind plumbing fixtures by brackets and U-bolts secured to cast iron stacks. Size U bolts to bear on the piping.
- E. Hangers shall be complete with rods and supports proportioned to the size of pipe to be supported, in accordance with manufacturer's recommendations.
- F. Hangers for cast iron pipe and steel plumbing pipe shall be Fee & Mason 104.
- G. Support piping 2-1/2" and larger in new concrete construction, from adjustable type inserts; Grinnell 282 or Fee & Mason 2570. Where weight to be supported by an insert is 300 lb. or more, install two (2) #3 reinforcing rods, 3' long through yoke of insert.
- H. Support piping in bar joist construction with Fee & Mason 269,270 clamps.
- I. Do not pierce waterproofing with support bolts.
- J. Size hangers for insulated piping to bear on outside of insulation except hangers for copper tubing shall be installed bearing on the pipe.
- K. Shield for Insulated Piping 2 inches and Smaller: 18 gauge galvanized steel shield over insulation in 180 degree segments, minimum 12 inches long at pipe support.
- L. Shield for Insulated Piping 2-1/2 Inches and Larger (Except Cold Water Piping): Pipe covering protective saddles.
- M. Shields for Insulated Cold Water Piping 2-1/2 Inches and Larger: Hard block non-conducting saddles in 90 degree segments, 12 inch minimum length, block thickness same as insulation thickness.
- N. Shields for Vertical Copper Pipe Risers: Sheet lead.

**2.02 HANGER RODS**

- A. Steel hanger Rods: Threaded both ends, threaded one end, or continuous threaded.

**2.03 INSERTS**

- A. Inserts: Malleable iron case of steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms; size insets to suit threaded hanger rods.

**2.04 FLASHING**

- A. Refer to Division 7 for flashing requirements.

**2.05 SLEEVES**

- A. Provide where pipes pass through walls, floors and roofs. All gas piping shall be sleeved.
- B. Sleeves shall be standard weight steel pipe except sleeves for concealed piping through floors, not in structural members and through interior drywall construction may be 26 gauge galvanized sheet metal.
- C. Sleeves are not required at individual plumbing fixtures.
- D. Floor sleeves for exposed piping shall extend from the bottom of the slab to 4" above the finished floor in mechanical equipment rooms, 3/8" above finished floor elsewhere.
- E. Omit pipe sleeves in concrete floor slabs on grade. See applicable gas code for gas piping.
- F. Wall sleeves shall be full thickness of walls.
- G. Sleeves may be omitted when openings are core drilled for vertical concealed piping and horizontal piping.
- H. Make sleeves through outside walls watertight. Caulk between plumbing pipe and sleeve with oakum and lead. Pack with fiberglass and caulk, 1" deep at each face, with non-hardening sealant between insulated pipe and sleeve.
- I. Size sleeves for insulated pipes to allow full thickness insulation.
- J. Pipes penetrating walls below grade shall be sealed with a waterproof, modular, mechanical expansion seal consisting of interlocking synthetic rubber links shaped to continuously fill the annular space between the pipe and wall opening. Sizing of links and wall sleeve shall be determined by manufacturer. Thunderline "Link Seal".
- K. Sleeves for Pipes through Non-fire Rated Floors: Form with 18 gauge galvanized steel.
- L. Sleeves for Pipes through Non-Fire Rated Beams, Walls, Footings and Potentially Wet Floors: Form with steel pipe or 18 gauge galvanized.
- M. Sleeves for Pipes through Fire Rated and Fire Resistive Floors and Walls and Fireproofing: Prefabricated fire rated sleeves including seals, UL listed.
- N. Stuffing Insulation: Glass fiber type, non-combustible.

**2.06 FABRICATION**

- A. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.
- B. Design hangers without disengagement of supported pipe.
- C. Provide copper plated hangers and supports for copper piping.

**2.07 FINISH**

- A. B-line Exposed hangers and supports shall be hot dipped galvanized. Field cuts and/or scratches of supports in exposed areas shall be painted with a primer coat of Glidden Tank and Structural Primer #5027 or other equivalent zinc rich gray paint. Hangers and supports located in damp spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.

**PART 3 - EXECUTION****3.01 INSERTS**

- A. Provide inserts for placement in concrete formwork.
- B. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches.



**Construction Specification****SUPPORTS AND ANCHORS****3.02 PIPE HANGERS AND SUPPORT**

- A. Support horizontal piping as follows:

PIPE SIZE DIAMETER	MAX. HANGER SPACING	HANGER
1/2 to 1-1/4"	6'-6"	3/8"
1-1/2 to 2"	8'-0"	3/8"
2-1/2 to 3"	8'-0"	1/2"
4 to 6"	8'-0"	5/8"
8 to 12"	8'-0"	7/8"
PVC (all sizes)	4'-0"	3/8"

- B. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
- C. Place a hanger within 12 inches of each horizontal elbow.
- D. Use hangers with 1-1/2 inch minimum vertical adjustments.
- E. Support horizontal cast iron pipe adjacent to each hub, with 5 feet maximum spacing between hangers.
- F. Support vertical piping at every floor. Support vertical cast iron pipe at each floor at hub.
- G. Where several pipes 2-1/2" and smaller run parallel and in the same plane, they may be supported on gang or multiple hangers; larger piping shall be independently hung, parallel and equally spaced.
- H. Support riser piping independently of connected horizontal piping.

**3.03 FLASHING**

- A. Refer to Division 7 for flashing requirements.
- B. Flash floor drains in floors with topping over finished areas with lead, 10 inches clear on sides with minimum 36 x 36 inch sheet size. Fasten flashing to drain clamp devices.
- C. Seal mop sink drains watertight to adjacent materials.
- D. Provide curbs for mechanical roof installation 14 inches minimum above roofing surface. Flexible sheet flash and counterflash with sheet metal; seal watertight.

**3.04 SLEEVES**

- A. Set sleeves in position in formwork. Provide reinforcing around sleeves.
- B. Extend sleeves through floor one inch above finished floor level. Caulk sleeves full depth and provide floor plate.
- C. Where piping or ductwork penetrates floor, ceiling, or wall, close off space between pipe or duct and adjacent work with stuffing/fire stopping insulation and caulk seal air tight. Provide close fitting metal collar or escutcheon covers at both sides of penetration.
- D. Install chrome plated steel, plastic or stainless steel escutcheons at finished surface.

END OF SECTION

**PART 1 - GENERAL****1.01 DESCRIPTION**

- A. The extent of HVAC insulation work is indicated by drawings and by the requirements of this Section.

**1.02 QUALITY CRITERIA**

- A. Qualification of Products.
1. Products of manufacturers listed are acceptable for the specified functions noted when approved for function, arrangement and compatibility with other adjacent work.
  2. Rating
    - a. Insulation, unless specifically excepted, shall have composite fire and smoke hazard ratings as tested by procedure ASTM #84, NFPA 255 and UL 723, not exceeding: Flame Spread 25, Smoke Developed 50.
    - b. Accessories, such as adhesive, mastics, cements, tapes and glass cloth for fitting shall have same component ratings as listed above.
    - c. Treatment of jackets or facings to impart flame and smoke safety shall be permanent. Use of water-soluble treatments is prohibited.

**1.03 SUBMITTALS TO CONTRACTOR**

- A. Certification, prior to installation, that products to be used meet rating criteria.
- B. Manufacturer's Standard Installation Instructions amended to comply with project. The term "manufacturer's instructions" used in this section refers to this submission unless otherwise noted.

**1.04 PRODUCT DELIVERY, STORAGE AND HANDLING**

- A. Product Delivery: Deliver insulation, coverings, cements, adhesives and coating to the site in factory-fabricated containers with the manufacturer's stamp or label affixed showing fire hazard ratings of the products.
- B. Product Storage: Store products in original wrappings in dry area and protect from being contaminated by dirt, water, grease or foreign matter.
- C. Do not install damaged insulation; remove from project site.
- D. Maintain insulation in dry condition and apply to dry surfaces.
- E. Complete Piping Pressure Testing specified in the respective sections before insulation is applied.
- F. Inspect job for conditions that would prevent execution of this work as specified. Do not proceed until such conditions are corrected.
- G. Schedule work to minimize job site damage to applied insulation or insulation surface. Damaged insulation shall be replaced by Contractor.
- H. Insulation that has been found exposed to water will not be accepted.

**1.05 CODES AND STANDARDS**

- A. Comply with requirements of NFPA 90A for ratings on flame spread and smoke produced.
- B. Except where specified to the contrary, do not use a product in a composite system that will not meet the above requirements.

**PART 2 - PRODUCTS****2.01 SHEET METAL INSULATION**

- A. Manufacturers: Provide insulation products produced by one of the following for each type and temperature range of insulation:
1. Armstrong
  2. Certainteed
  3. Manville
  4. Owens-Corning Fiberglass
  5. Knauf
- B. Provide as follows:

<u>TYPE</u>	<u>MFG. NAME</u>	<u>THICKNESS</u>	<u>BTU. IN/HR SF. DEG. F.</u>
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**Construction Specification****Section 15250  
HVAC INSULATION**

Supply & Return Air	Owens Faced Duct Wrap 150	2"	.75
Liner	Owens Aeroflex 200	1"	.75
Acoustical Liner	Owens Aeroflex 200	1"	.75

California Projects only:

<u>TYPE</u>	<u>MFG. NAME</u>	<u>THICKNESS</u>	<u>BTU. IN/HR SF. DEG. F.</u>
Supply & Return Air	Owens Faced Duct Wrap 150	2"	.25
Liner	Owens Aeroflex 200	1"	.25
Liner Alternate:	1" Liner + 1" Wrap using same products as above		
Acoustical Liner	Owens Aeroflex 200	1"	.25
Acoustical Liner Alternate:	1" Acoustic Liner + 1" Wrap using same products as above		

**C. Flexible Duct Wrap Insulation:**

1. Material: Flexible fiberglass with factory-applied .0025" thick aluminum foil vapor barrier jacket. Johns-Manville Microlite.
2. Application: Install insulation with ends and edges overlapping 3". Vapor seal joints and jacket punctures. Wrap all rigid round ductwork. Wrap all outside air duct.

**D. Rigid Board Liner Insulation -** Adhere liner to inside of duct with 100% coverage of adhesive. Mechanical fasteners shall be used at maximum 16 inch on center on top sections over 12 inches wide and side sections over 24 inches high. Coat exposed edges and joints with edge sealer. Protect leading edges against flaking by 24 gauge galvanized metal protectors. Butt edges of lining tightly together to form a continuous thermal barrier.**E. Construction and installation of flexible ductwork shall be in conformance with SMACNA "flexible Duct Installation Standards."****PART 3 - EXECUTION****3.01 INSTALLATION**

- A. Install insulation tightly and neatly. Finish insulation smoothly without bulges, protrusions, raw edges or wrinkles. Finish and protect ends and edges.
- B. Cover stiffeners and projections with not less than one-half thickness of specified insulation.
- C. Overlap longitudinal and butt joints 3" minimum with joint strips of jacket material and bond with Childers CP-82 adhesive, unless noted otherwise.
- D. Seal past obstructions without interruptions. Seal jacket punctures with jacket material bonded with Foster 85-20 adhesive, unless noted otherwise.
- E. Mechanical Fasteners: Foster, Gemco, Graham or Stick-Klips bonded to metal surface with Foster 82-55 adhesive.
- F. Seal ends of cold pipe insulation at valves, fittings, flanges and intervals of not more than 21 feet on straight pipe runs with Childers CP-32 vapor barrier coating unless noted otherwise.
- G. Cold material insulation shall pass through sleeves, supports and pipe hangers uninterrupted.
- H. Aluminum Protectors: Install where insulated pipe meets building structure or metal casing.

**END OF SECTION**

**PART 1 - GENERAL****1.01 SUMMARY**

- A. The domestic water, sanitary drain, storm water, natural gas, and compressed air piping and connections shall be made under this Division of the Specifications.
- B. Related work specified elsewhere includes but is not limited to:
  - 1. Section 15410 - Plumbing Fixtures
- C. All material listed in the Plumbing Fixture Schedules as "Bathroom in a Box" material shall be purchased per the requirements of Section 15410. Any required material not listed as "Bathroom in a Box" material is the plumbing contractor's responsibility to supply, and may be procured through any distributor of the contractor's choice (other than Home Depot's retail competitors) per this section.

**1.02 WARRANTY**

- A. Warranty service shall be provided for a period of one (1) year after Grand Opening date.

**1.03 MAINTENANCE**

- A. Furnish special wrenches and other devices necessary for servicing plumbing fixtures and trim to Owner with receipt. Furnish one (1) device for every forty (40) units, but in no case less than two (2) devices.

**PART 2 - PRODUCTS****2.01 ACCEPTABLE MANUFACTURERS**

- A. Acceptable manufacturers of drainage products are: Wade, Zurn, Josam, J.R. Smith, ANCON.
- B. Acceptable manufacturers of valves are: Crane, Hammond, Stockham, Nibco, Jenkins, Kennedy, Mueller Walworth, Rockwell, Nordstrom, Milwaukee.
- C. Acceptable manufacturers of plumbing specialties are: Watts, A.W. Cash, Robert Shaw, Nidel.

**2.02 DOMESTIC WATER AND GARDEN CENTER IRRIGATION SYSTEMS**

- A. Provide complete systems of cold and hot piping and accessories so that every piece of water using equipment will be furnished with a water supply. Extend to points indicated on the Drawings.
- B. Piping and Fittings:
  - 1. Pipe and fittings shall be as listed herein and shall be used on the services indicated.
  - 2. Type "L" hard drawn copper tubing, Fed. Spec. No. WW-T-799, with soldered joints and wrought copper socket fittings for: all above ground water piping 3" in size and smaller.
  - 3. Type "K" hard drawn copper tubing, Fed. Spec. No. WW-T-799, with brazed joints and wrought copper socket fitting for: all below ground copper piping.
- C. Joints:
  - 1. Solder joints for Type "L" copper tubing shall be made using 95-5 tin-antimony solder with a compatible flux.
  - 2. Brazed joints shall use a BCUP-5 brazing alloy with a compatible flux.
  - 3. Solder for potable water piping shall be lead free.
- D. Dielectric Adapters:
  - 1. Dielectric adapters shall be provided between copper and iron pipe connections and between ferrous and non-ferrous piping or equipment.

**2.03 SANITARY, WASTE AND VENT SYSTEM**

- A. General:
  - 1. Provide complete system of sanitary, waste and vent piping to points indicated on the drawings.
- B. Pipe and Fittings:
  - 1. Pipe and fitting shall be as listed herein and shall be used for the services indicated.
  - 2. Service weight coated cast iron soil pipe and fittings. ASTM A74, with hub and spigot joints for: all sanitary, waste, vent and roof drainage piping below ground. Above ground use hubless pipe with stainless steel clamps and

- neoprene gaskets on piping 2" in size or larger. Couplings: "Husky" heavy duty stainless steel clamps from Anaheim Foundry Company, conforming with Cast Iron Soil Pipe Institute Pamphlet 100. No coupling shall have less than 4 clamp rings. No substitutions on couplings. Underground piping, where allowed by Code, may be SDR-35 with solvent cemented joints.
3. Extra strength vitrified clay pipe and fittings, ASTM C700 with plastic collar joints, ASTM C594 for sanitary sewer from 5'-0" beyond the building wall.
  4. Exposed piping shall be Schedule 40 PVC with drainage pattern fittings and solvent-cemented joints and exterior piping shall be PVC with gasketed joints, SDR-35 minimum wall thickness.
- C. Joints:
1. Joints for cast iron pipe below the floor shall be made with a mixture of graphite and oil oakum and molten lead or neoprene compression gaskets. Hubless piping shall have neoprene gaskets and 24 ga. stainless steel bands and clamps. Torque 125 in. lbs., 150 in. lbs. for vandal proof. Equal to Clamp-All.
  2. Threaded joints for steel pipe shall be made with a mixture of graphite and oil applied to male threads only. After cutting, but prior to threading, pipe shall be reamed and have burrs removed.
  3. Joints for PVC interior piping shall be solvent cemented. Exterior PVC piping shall be gasketed.
- D. Drains:
1. Floor drains shall be set flush with the floor. All floor drains shall be vandal proof.
  2. Drains in the Houseplant Area and Garden Center shall have extra heavy duty cast iron heel proof pedestrian grates.

## 2.04 STORM WATER PIPING

- A. Basic Pipe, Tube and Fittings:
1. Aboveground Piping, 8" size and smaller:
    - a. No-Hub Cast Iron soil pipe, CISPI 301.
      - i. Pipe Class: Service weight (SW).
      - ii. Fittings: No-Hub cast iron soil pipe fittings, with stainless steel clamps and neoprene gaskets.
      - iii. Gaskets: Neoprene gasket joints, ASTM C-564.
      - iv. Couplings: "Husky" heavy duty stainless steel clamps from Anaheim Foundry Company. No coupling shall have less than 4 clamp rings. No substitutions.
      - v. Galvanized Steel pipe, ASTM A-53, type E or S, grade A or B, Schedule 40.
      - vi. Where indicated on drawings, PVC schedule 40 piping may be utilized, including in garden center.
    2. Underground Building Drain Piping:
      - a. Cast Iron hub and spigot soil pipe, ASTM A-74.
        - i. Pipe Class: Service weight (SW).
        - ii. Fittings: Cast iron, hub and spigot soil pipe fittings.
        - iii. Gaskets: Neoprene compression gasket joints, ASTM C-564.
      - b. PVC plastic pipe, ASTM D-2665, Schedule 80.
    3. Interior above grade piping where allowed by code may be Schedule 40 PVC. Couplings as stated for no-hub cast iron.
    4. Underground piping, where allowed by Code, may be SDR-35 PVC with solvent cemented or gasketed joints.
- B. Special Expansion Compensation:
1. Expansion joints shall be cast-iron body, adjustable bronze sleeve, bronze bolts with wing nuts; for vertical installation only.
  2. Subject to compliance with requirements, provide expansion joints of one of the following:
    - a. Josam Mfg. Co.
    - b. Wade Div., Tyler Pipe
    - c. Zurn Industries, Hydromechanics Div.
- C. Execution
1. Install storm water piping pitched to drain at minimum slope of 1/4" per foot (2%) for piping 3" and smaller, and 1/8" per foot (1%) for piping 4" and larger, unless shown or noted otherwise.

## 2.05 NATURAL GAS PIPING

- A. Gas piping from the outlet of the gas meter shall extend to all equipment requiring gas.
- B. Piping shall be Schedule 40 black steel with X-heavy black malleable iron banded screwed or weld pattern fittings as applicable (ASA-B16.3).
- C. All piping and fittings located outdoors and above grade shall be cleaned free of rust and painted with aluminum base paint as specified in painting specification section.

- D. Apply two coats of asphaltum base paint to piping buried underground.
- E. Each piece of equipment shall be provided with lubricated plug valve with a handle, union and drip leg at the unit connection.
- F. Provide a pressure regulator for each piece of gas fired equipment for all delivery pressures 1/4 PSI or greater. Regulators shall be as specified on drawings.

## 2.06 PLUMBING SYSTEMS VALVES

- A. Valves shall have the name or trademark of the manufacturer and the working pressure stamped or cast on the valve body.
- B. Domestic Water System:
  - 1. Gate valves 3" in size and smaller shall have bronze body, non-rising stem, solid wedge, and solder ends for 200 pounds W.O.G. Valves shall be Crane No. 1324, or equal.
  - 2. Check valves 3" in size and smaller shall be horizontal swing type with bronze body, composition disc, and solder ends for 200 pound W.O.G. Valves shall be Crane No. 1342, or equal.
  - 3. Globe valves shall have bronze body, rising stem, composition disc and solder ends for 200 pound W.O.G. Valves shall be Crane No. 1310 or equal.
- C. Valves for Natural Gas Systems
  - 1. Lubricated plug valves 3" in size and larger shall be the semi-steel type with cast iron body, lubricated cast iron plug, flanged ends, and wrench operated for 175# WOG. Valves shall be:
    - a. Rockwell Nordstrom No. 143
    - b. Walworth 1797F
  - 2. Lubricated plug valves (2-1/2" in size and smaller) shall have bronze body and plug, threaded ends, and square head for 125# WOG. Valves shall be:
    - a. Crane No. 250
    - b. Walworth 554
  - 3. Lubricated plug valves shall be lubricated at the factory and sealant shall be suitable for natural gas. Provide six (6) sticks or tubes of sealant utilized and turn such over to the Owner's Representative.
  - 4. Provide one (1) valve wrench for each size and type of valve head and turn such wrenches over to the Owner's Representative.

## 2.07 CONDENSATE DRAINAGE

- A. Basic pipe, tube and fittings:
  - 1. Pipe inside and outside building shall be schedule 40 PVC with solvent cemented joints. Fittings shall be schedule 40 PVC.
- B. Installation of piping:
  - 1. Install condensate drainage piping pitched to drain at minimum slope of 1/4" per foot (2%) for piping 3" and smaller, and 1/8" per foot (1%) for piping 4" and larger.

## 2.08 PLUMBING SYSTEM INSULATION

- A. All insulation shall be applied in a neat and workmanlike manner. Remove and replace all insulation not applied in strict accordance with manufacturer's specifications or not presenting a neat appearance. Insulation shall be continuous through wall and ceiling openings and sleeves. All insulation shall be applied by contractor specialized in insulation application, in accordance with best trade practices and as guided by manufacturer's printed installation directions.
- B. Work Included: Pipe covering for domestic hot water, cold water, interior roof drain piping, and interior condensate piping.
- C. Materials and Installation: No pipe insulation shall be applied until piping has been pressure tested and approved. All insulation shall be applied strictly in accordance with the manufacturer's recommendations. Materials as manufactured by Johns Manville, Fiberglass, Phillip Carey, or Armstrong will be acceptable if equal to those specified. All insulation on indoor work shall have composite fire and smoke hazard ratings as tested by procedure NFPA 255 not exceeding: Flame Spread 25, Fuel Contributed 50, Smoke Developed 50.
- D. Accessories such as adhesives, mastics, cements, tapes, and cloth for fitting, shall have the same component ratings as listed above. Insulation shall have an average thermal conductivity not to exceed 0.25 BTU/inch of thickness per square foot per 1 degree F. at a mean temperature of 75 degrees F.

CALIFORNIA PROJECTS: Accessories such as adhesives, mastics, cements, tapes, and cloth for fitting, shall have the same component ratings as listed above. Insulation shall have an average thermal conductivity not to exceed 0.25 BTU/inch of thickness per square foot per 1 degree F. at a mean temperature of 100 degrees F.

- E. Domestic Hot Water Piping: All domestic hot water piping shall be insulated with 1" thick fiberglass pipe insulated with foil-kraft laminate vapor barrier fastened with pressure sensitive tape and lapped 12" minimum. All fittings, valves, flanges, etc. shall be covered with PVC fitting cover, taped and tacked fastened.
- F. Cold Water Lines: All domestic interior cold water piping shall be insulated with 1" thick fiberglass insulated with foil kraft laminated vapor barrier fastened with pressure sensitive tape and lapped 12" minimum. All fittings, valves, strainers, flanges, etc. shall be covered with PVC fitting cover, taped and tacked fastened.
- G. No insulation shall be installed on any piping before building is adequately closed in. Where necessary to install any insulation before it is protected by building enclosures, permission shall be secured first. Where permission is granted, the covering must be effectively protected by roofing felt, wired on the covering to make an absolute waterproof protection for the pipe covering.
- H. Roof Drain Lines: Roof drain lines and sumps shall be insulated the same as cold water lines above.
- I. All condensate lines within building shall be insulated the same as cold water lines above.
- J. Where shown on the drawings or required by governmental agencies having jurisdiction, at lavatories for handicapped persons provide "Handi Lav-Guard" 102, color white, as manufactured by Truebro, Inc., Ellington CT (203/875-2868).

## 2.09 HANGERS AND SUPPORTS

- A. Furnish and install all piers, foundations, supporting material, hangers, clamps, inserts, etc., necessary for the installation of all pipes and equipment.
- B. Soil, waste and vent stacks shall be well supported at the base of the riser.
- C. Supports for copper pipes, 2 1/2" or larger shall be placed on 12' centers. Supports for smaller pipes shall be placed on 8 foot centers. Supports for vertical pipe shall be placed at top and bottom of pipe on each floor and shall be Grinnel or Elcen. Insulation shall run continuous through all hangers and supports.

## 2.10 COMPRESSED AIR PIPING

- A. Provide complete system of compressed air piping complying with ASME B31.9, "Building Services Piping".
- B. Piping and Fittings:
  - 1. Copper tube, wrought -copper fittings, and brazed joints.
  - 2. Schedule 40, black-steel pipe, threaded malleable-iron fittings and threaded joints.
  - 3. Valveless Quick Coupling, straight through brass body with stainless steel or nickel plated operating parts;
    - a. Socket end: with o-ring or gasket seal, without valve, and with serrated inlet for attaching hose.
    - b. Plug End: with serrated outlet for attaching hose.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

- A. Unions shall be provided at all piping connections to equipment.
- B. Changes in water pipe size shall be made with reducing fittings. No bushings will be allowed.
- C. Horizontal soil and waste piping 2 1/2" in size and smaller shall be sloped a minimum of 1/4" per foot. Horizontal soil and waste piping 3" in size and larger shall be sloped at a minimum of 1/8" per foot.
- D. Soil, waste and vent piping changes in pipe size shall be made with reducing fittings and changes in pipe direction shall be made with fittings. No bushings shall be allowed.
- E. Hubs on all drainage and vent piping shall have the open hub end facing against the direction of the flux.

### 3.02 TESTING

- A. General:
  - 1. Concealed, underground and insulated piping shall be tested in place before concealing, burying, or covering. Equipment, materials and instruments required for tests shall be furnished by the Contractor without additional cost to the Owner.
- B. Plumbing Systems:

1. Soil, waste and vent piping shall be tested with water before installing fixtures. Water test shall be applied to the system either in its entirety or in sections. If the test is applied to the entire system, all openings in the piping shall be closed except the highest opening, and the system shall be filled with water to the point of overflow.
2. The entire hot and cold water piping systems shall be tested at a hydrostatic pressure of not less than 100 pounds per square inch gauge (before insulation is applied), and proved tight at this pressure for not less than 30 minutes in order to permit inspection of all joints.

### 3.03 DISINFECTION OF DOMESTIC WATER PIPING

- A. Prior to starting work, verify system is complete, flushed and clean. Disinfection procedure shall comply with all local requirements.
- B. Ensure PH of water to be treated is between 7.4 and 7.6 by adding alkali or hydrochloric acid.
- C. Inject disinfectant, free chlorine in liquid, powder, tablet or gas form, throughout system to obtain 50 to 80 mg/L residual.
- D. Bleed water from outlets to ensure distribution and test for disinfectant residual at minimum 15 percent of outlets.
- E. Maintain disinfectant in system for 24 hours.
- F. If final disinfectant residual tests less than 25 mg/L, repeat treatment.
- G. Flush disinfectant from system until residual equal to that of incoming water or 1.0 mg/L.

END OF SECTION



**PART 1 - GENERAL****1.01 SUMMARY**

- A. Provide Plumbing Fixtures as indicated on Drawings and as specified herein.
- B. Related work specified elsewhere includes but is not limited to:
  - 1. Section 01011 - Special Purchase Program
  - 2. Section 01012 - Preferred Purchasing
  - 3. Section 15400 - Plumbing

**1.02 SPECIAL PURCHASE PROGRAM (SPP)**

- A. The Home Depot has a National Accounts arrangement with the manufacturer or suppliers of specific equipment as listed on drawings. The Contractor must purchase products from the listed manufacturer or supplier, as defined under this section and per the requirements of Section 01011. The Contractor shall cooperate with SPP vendors, and shall be responsible under this section to provide supervision, equipment, material storage and handling, or warranty for materials. Contractor shall review and coordinate all modifications in SPP Documents that impact the scope of work for the Contractor.
- B. Vendor Contact: Contractor is to contact the Vendor at least six (6) weeks prior to the scheduled start date of installation.

Southern Pipe & Supply Co., Inc.  
340 River Street  
Ellijay, GA 30540  
Office: (706) 636-5488, Fax: (706) 636-5489  
E-Mail: Homedepot@southernpipe.com
- C. All material listed in the Plumbing Fixture Schedules as "Bathroom in a Box" material shall be purchased by the contractor through the SPP vendor. Any required material not listed in the construction drawing schedules as "Bathroom in a Box" material is the plumbing contractor's responsibility to supply per the requirements of Section 15400.
- D. The plumbing contractor shall specify the mix of material and the required date of delivery. The Plumbing Contractor shall be permitted a maximum of three deliveries. Plumbing Contractor shall be responsible for the quantity of fixtures for the project.

**1.03 WARRANTY**

- A. Warranty service shall be provided for a period of one (1) year after Grand Opening date.

**PART 2 - PRODUCTS****2.01 ACCEPTABLE PRODUCTS**

- A. Provide Plumbing fixtures of manufacturer and model numbers per drawings

**PART 3 - EXECUTION****3.01 INSTALLATION**

- A. Install all plumbing fixtures per the requirements of Section 15400

**END OF SECTION**

**Construction Specification****ABOVE GROUND IRRIGATION SYSTEM****PART 1 - GENERAL****1.01 SUMMARY**

- A. Provide a complete and operational above ground irrigation system as indicated in the construction drawings. The installation shall be complete with all fixtures, fittings, trim and accessories. The system is designed and should be installed to provide the proper amount of water each type of plant material on a predetermined schedule.

**1.02 SUBMITTALS**

- A. The irrigation plans and specifications are to be given to each individual store manager for his review prior to commencement of the system installation. Any questions can be answered at this time.
- B. Samples of materials may also be requested by the store manager prior to commencement.

**1.03 PROJECT CONDITIONS**

- A. Protect existing buildings, walks, walls, roof tresses, plant and material racks and saleable goods from damage. All damage resulting from negligence shall be repaired or replaced by the contractor to the satisfaction of the Home Depot store manager or his superiors.
- B. The irrigation system is being installed in a retail garden center and the appearance of its fixtures and their installations shall be in accordance with standard Home Depot store construction specifications.

**1.04 WARRANTY**

- A. The irrigation system will be warranted to be free of defects in materials and workmanship for a period of one (1) year from the date of the final acceptance. The warranty will not cover damage to materials from obvious vandalism, theft or acts of providence including but not limited to lighting, flooding, freezing and wind damage.

**PART 2 - PRODUCTS****2.01 HOME DEPOT VENDORS**

- A. All materials specified are available through Home Depot or its vendors. Whenever possible the materials should be utilized. Available materials include but are not limited to controller, valves, pipe, heads, wire and hanging hardware.

**2.02 CONTROLLER AND VALVES**

- A. The irrigation timer shall be a Rain Bird ESP 12LX commercial controller. This controller has 4 separate programs, which will be necessary for the irrigation system. The controller is to be located per the drawings. A 110-volt power outlet is to be provided by Home Depot. It is up to the irrigation contractor to continuous power at the outlet. Some of the power outlets are controlled by a timer. Install timer as per the details.
- B. The automatic control valves shall be Rain Bird DV100 (1"). The valves are to be installed as per the details with filters and pressured regulators as needed.

**2.03 ROTOR HEADS**

- A. Rotor heads will be Rain Bird T-Bird series or K-Rain 4" gear driven. Install heads per the details.

**2.04 SPINNERS/DRIP EMITTERS**

- A. All spinners and drip emitters will be supplied by DIG Corporation. Most of these materials come pre-assembled.

**PART 3 - INSTALLATION****3.01 GENERAL**

- A. Drain valves will be installed at the end of each zone and an air compressor port will be installed at the manifold. The purpose of this is for winterization of the system.
- B. All materials and equipment will be installed as per manufacturer's recommendations and the construction drawings.

**3.02 OPEN GARDEN AREA**

- A. The open garden area is to be irrigated with gear driven rotors. There will also be two separate zones depending on the available water pressure. Each rotor will use 3.4 gallons per minute and will have a radius of 36 to 46 feet.

**Construction Specification****ABOVE GROUND IRRIGATION SYSTEM**

- B. All heads in this area are to be spaced at 36' on center **or more**. One head will be installed in each of the four corners and the remaining heads will be placed accordingly. This will produce an overlapping pattern to allow for 100% coverage.
- C. The lateral lines that run along the outside will be secured to the fence with 1 1/4" single hole EMT straps and nylon straps where necessary. The heads in this section will be mounted to the material racks inside a 3" schedule 40 PVC sleeve as shown in the details.
- D. The Lateral lines that run along the roof will be secured to the underside of the roof truss using nylon straps and metal hose clamps where necessary. The heads in the section will be mounted to the roof truss with a 6" "L" bracket as shown in details.
- E. The open garden section should be watered for a period as required for the plant types and the region in which the store is located.

**3.03 PICK UP LANE**

- A. This is the section located along the front fence of the garden and usually has plant material located in it located from the fence forward to the edge of the pavement. Provide full irrigation coverage for this section utilizing gear driven rotors or fixed spray heads for smaller areas.
- B. There will be one zone for this section of either 4 or 5 rotors depending on the size of the garden center. Each rotor will use 3.4 gallons per minute and will have a radius of 36 to 38 feet.
- C. All heads in this area are to be spaced 27' on center **or less**. One head will be installed in each corner and the remaining heads will be spaced accordingly. This will produce an overlapping pattern to allow for 100% coverage.
- D. The lateral lines will run along the fence and will be secured with 1 1/4" single hole EMT straps and nylon straps where necessary.

**3.04 SHADE CLOTH AREA**

- A. The shade cloth area contains 4 to 10 annual racks that will be irrigated using spinner heads as shown on the drawings and details. The spinner heads will be installed using 1/2" poly tube that will be suspended from the ceiling. The poly tube will be suspended from the ceiling utilizing 1/8" single hole EMT straps and nylon straps where necessary.
- B. The spinner heads will be spaced at 48" on center and will be run parallel with the annual tables. The heads will hang down 24" from the underside of the ceiling.
- C. There are to be no other spinner heads installed in this area other than the annual tables.

**3.05 HANGING BASKET RACKS**

- A. Coverage will be provided to two large hanging basket racks using a single drip emitter as shown in drawings. There can and will be many different variables to the location, quantity and size of the racks. There may also be several racks that are suspended from the ceiling in the shade cloth area.
- B. The drip emitters will be installed using a 1/2" poly tube that will be mounted to the bottom of the rail that the baskets are hanging on. The emitters will be placed approximately 3" on center depending upon size of the rack.
- C. The drip emitters will be on a separate zone and can operate during the day if necessary. It is important to instruct the store manager on how the baskets need to be placed on the racks to ensure that they will get watered.

**3.06 FINAL INSPECTION**

- A. Upon final completion of the system a final inspection is to be performed with the store manager. The district manager may also be present. This is to be set up by a knowledgeable representative of the contractor no more than 48 hours after completion.
- B. A product knowledge class should also be given at this time to demonstrate the complete operation of the irrigation system with the store manager, assistant store manager, the garden center manager and the assistant garden center manager. Anyone else interested in the system operation should also attend.
- C. Supply the store manager with as built drawings, product manuals and any special tools. Also, supply the manager with emergency phone numbers for the contractor.

END OF SECTION

**Construction Specification****RAINWATER HARVESTING SYSTEM****PART 1 - GENERAL****1.01 SUMMARY**

A. This Section includes engineering, fabricating, furnishing, and installing:

1. Rainwater Harvesting System(s).
  - a. Roof rainwater collection system.
  - b. Condensate collection system.

B. Related work specified elsewhere:

1. Division 2 – landscaping and irrigation sections
2. Section 05501 – Metal Fabrications
3. Division 7 – Roofing, Flashing and Sheetmetal sections
4. Division 15 – Plumbing
5. Section 15430 - Above Ground Irrigation System (if applicable)
6. Division 16 – Electrical

**1.02 DEFINITIONS**

A. Rainwater Harvesting System: An assembly that collects, stores, and distributes rainwater for use on site; including water treatment as appropriate to intended use.

**1.03 SUBMITTALS**

A. Product Data: Submit product data on all components of the rainwater harvesting system[s]. Unless otherwise indicated, include the following for each type of product provided under work of this Section:

1. Manufacturer's brochure indicating equipment model(s).

B. Shop Drawings: For each system, include plans, sections, details, and attachments to other work, for the following:

1. Pumps.
2. Storage Tank(s).
3. Connection to collection system(s).
4. Connection to irrigation system.

C. Calculations: For each system, submit the following:

1. Maximum water capacity.
2. Collection data: Include the following:
  - a. average rainfall rate (inches annually)
  - b. total collection area (s.f.)
  - c. potential collection (s.f.= gallons)
  - d. peak gallons @ 5"/hour
  - e. peak gallons @ 5 min. duration
  - f. available gallons
3. Water Demand: Include the following:
  - a. application rate / week (high) gallons
  - b. application rate /week (low) gallons
  - c. gallons required

D. Designer/Installer Qualifications.

E. Operation and Maintenance Manuals Submittals: Provide the following:

1. Operation and maintenance procedures, including variations of procedures appropriate for normal climatic conditions anticipated throughout an annual cycle of operations.
2. Water testing laboratory contact information.
3. Water testing requirements, schedule, kits, and equipment.

F. Reports for Field Quality Control: Submit test reports and inspection reports to Architect or Record.

1. System Inspections.
2. Water Quality Tests.

G. Closeout Submittals:

1. Warranty.

**Construction Specification****RAINWATER HARVESTING SYSTEM****1.04 QUALITY ASSURANCE**

- A. Designer/Installer Qualifications: For work of this Section, engage an experienced Climate, LLC rainwater consultant who has specialized in systems similar to those required for this Project and with a record of successful in-service performance. Consultant shall:
1. be a member in good standing of The American Rainwater Catchment Systems Association.
  2. have a minimum 5 years of experience designing and constructing rainwater catchment systems similar to requirements for this Project.
  3. Be an accredited professional
- B. Single-Source Responsibility: To the greatest extent possible, obtain the system components from one source and from a single manufacturer, **Climate, LLC**.
- C. Installer shall contact the Owner's Civil and Stormwater Manager as indicated below

**D. Shad Kazerooni, P.E., Sr. Mgr. Civil / Stormwater**  
 2455 Paces Ferry Road, N.W., C-19  
 Atlanta, Georgia 30339-4024  
 Phone: 770-384-2280  
 Mobile: 404-444-7388  
[david\\_kazerooni@homedepot.com](mailto:david_kazerooni@homedepot.com)

**1.05 SEQUENCING AND SCHEDULING**

- A. Coordinate the Work with installation of associated roofing, waterproofing, flashings, and roof accessories specified under other sections as the Work of this Section proceeds.
- B. Coordinate the Work with installation of associated irrigation and plumbing systems specified under other sections as the Work of this Section proceeds.

**1.06 WARRANTY**

- A. Warranty: Warrant the system against defects including equipment failure and leakage, except for defects resulting from lack of adequate maintenance, neglect, or abuse by Owner, abnormal weather conditions unusual for warranty period.
1. Warranty Period: one (1) year after date of Substantial Completion

**PART 2 - PRODUCTS****2.01 SYSTEM COMPONENTS**

- A. System Manufacturer/Supplier

**Climate, LLC**  
 150 Pearl Industrial Ave  
 Hoschton, Georgia 30548  
 678-250-4430 O  
 216-496-0970 C  
 Rex Hayes  
[Rex.Climate@gmail.com](mailto:Rex.Climate@gmail.com)  
[www.ClimateIncorp.com](http://www.ClimateIncorp.com)

- B. Catchment Area:

1. Roofing as indicated.

- C. Downspout Collection

1. Provide nested gutter design as indicated in drawings. Supply and install 6" and 4" downspout piping and fittings to route the down spouts to the tank pre filtration.
2. Supply and install a **3P Technik** filter on the downspout pipe before the tank.

- D. Condensate Collection from HVAC units as specified in drawings"

1. PVC piping 2" and 1-1/4", route around back of building and then into tank at the Garden Center or as indicated in drawings.
2. Rooftop pump may need to be added to system to get condensate to flow to tank (refer to drawings)
3. **Home Depot will provide where applicable** one 3 way valve after all RTU's and after where the condensate lines are

**Construction Specification****RAINWATER HARVESTING SYSTEM**

- combined for ease of access and turn off when RTU's are being cleaned. Route drain line of three way valve down rear of building in PVC line to ground.
4. Home Depot will clean and flush RTU condensate pans and condensate lines with chlorinated water before making final connection with tank .
  5. Provide and install all necessary hangers, supports, and braces for new piping.
- E. Storage:
1. Tank: sized as appropriate to water demands of facility. Above ground design. **Climate Galvanized Bolted Steel Tank.** System design shall indicate load requirements for tank foundation. Tanks shall be accessible for routine maintenance.
    - a. Standard Tank Size: +/-4,500 gallon
    - b. **6ft diameter minimum to fit within one bay of the racking or in applicable designated area within close proximity to the garden canopy or directly to the main building.**
    - c. 21ft tall maximum height to be under the height of the canopy.
    - d. Wind Rated at a **minimum 150 mph** with anchor brackets.
    - e. Supply and install two pipe bollards, without guard rail between as indicated in drawings
  2. Cisterns (only if shown in construction drawings): Below ground design; accessible for cleaning and maintenance. Provide screens for all openings.
- F. **Water Treatment:**
1. **Filtration. Include catchment tank/pump system to pre-filter water prior to entry to storage tank. Carbon is not permitted.**
- G. Conveyance:
1. Submersible **or Centrifugal** Pump: 1-1/2 hp minimum, 15 amp, electric sized as appropriate to water demands of the system.
  2. Floating extractor on the intake side of pump -1-1/4" coarse screen.
  3. **Check valve (BFP / backup water solenoid valve to make up waterline).**
  4. **Pump controller switch, controlled by pressure drop to sense the need for water.**
  5. **1-1/4"** pressure PVC piping and fittings to route rainwater feed from tank to sprinkler system.
  6. 1-1/2" backflow preventer on irrigation supply line **supplied by Home Depot plumber.**
  7. Piping. Overflow pipe shall empty into a non-flooding area. Include removable filter lid for intermittent treatment as is deemed necessary on basis of regular inspection/testing.
- H. Accessories:
1. **Water meter** mounted on the supply side of the tank piping.
  2. Float switch to control three-way valve placed on municipal water line.
  3. **24 volt adapter for float switch.**
  4. Low voltage wire from tank to municipal water valve placement.
  5. Joint Sealants: Non-toxic and as specified in Division 7.
  6. Fasteners: **compatible with materials being fastened.**
- I. Signage
1. **All signage prepared, printed, and distributed to the contractor by Home Depot.**
  2. **Decal with Climate's information displayed on the outside of the galvanized tank.**
- J. Lead components are not permitted.

**2.02 FABRICATION**

- A. Design prefabricated components and necessary field connections required for installation to permit easy assembly, repair and maintenance, and disassembly.
- B. Design and construct to comply with applicable regulatory requirements.

**PART 3 - EXECUTION****3.01 EXAMINATION**

- A. Examine substrates, areas, and conditions under which system will be installed, with Designer/Installer present, for compliance with requirements.
- B. Do not proceed with installation until unsatisfactory conditions have been corrected.

**3.02 INSTALLATION**

**Construction Specification****RAINWATER HARVESTING SYSTEM**

- A. Install in accordance with manufacturer's written instructions, approved shop drawings, and applicable regulatory requirements.
- B. Permitting is separate and not required under initial installation. Home Depot will provide all required permitting as needed. Installer is not required to permit.

**3.03 FIELD QUALITY CONTROL**

- A. General: Comply with requirements of agencies having jurisdiction and as specified herein.
- B. System Inspection: System Designer/Installer shall inspect system installation and submit reports to Architect of Record. Notify Architect of Record and Owner 48 hours in advance of the date and time of inspection.
  - 1. Provide site inspection of system at Substantial Completion.
  - 2. Provide site inspection of system immediately after storm event that may be severe enough to affect the system; Home Depot will create work orders for all inspections before inspections can commence.

**3.04 SYSTEM MAINTENANCE**

- A. Installer to provide from completion of installation one (1) year of semi-annual maintenance (second visit shall be before the one (1) year guarantee period ends or if not done within time shall become the final inspection of the guarantee period).
  - 1. Inspect and clean out sediment, debris, and trash from components of system.
  - 2. Inspect condensate lines so they are not damaged, detached and are flowing condensate to the tank.
  - 3. Inspect that signs are still visible and intact.
  - 4. Inspect water meters and other valves for good working conditions.
  - 5. Inspect all components within the garden center that are part of the rainwater harvesting system.
  - 6. Note any required repair items after one (1) year guarantee period and e-mail list to Owner's Civil and Stormwater Manager.

END OF SECTION

**Construction Specification****(FBO) LOW INTENSITY RADIANT HEATERS (LENNOX-REZNOR)****PART 1 - GENERAL****1.01 SUMMARY**

- A. This Section covers gas fired, low intensity radiant heaters.
- B. General Provisions and Mechanical systems are specified in other Sections of Division 15.
- C. Related Work specified elsewhere includes but not limited to:
  - 1. Section 01010 - Furnished By Owner Items (FBO)
  - 2. Section 15960 - Energy Management Controls and Commissioning

**1.02 FBO PROCEDURES**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section. General requirements related to Furnished by Owner (FBO) Items are as defined in Section 01010. All FBO Forms listed below are included as part of Section 01010.
- B. Vendor Contact: Contractor shall send a completed "FBO Form A: Contractor Information Form" to the FBO vendor indicated below, twelve (12) weeks prior to the scheduled installation of the specified system:
 

Lennox Industries  
105 Summer Breeze Glen  
Sugar Hill, GA

National Accounts: Walker Roth  
Office: (404) 759-4878; Fax: (none)  
E-Mail: [walker.roth@Lennoxind.com](mailto:walker.roth@Lennoxind.com)

Pricing and Ordering: Derek Garen  
Office: (800) 367-6285; Fax: (none)  
E-Mail: [Derek.garen@lennoxind.com](mailto:Derek.garen@lennoxind.com)
- C. Take-Offs: FBO Vendor shall provide "take-offs" to the Contractor as specified in Section 01010. The Contractor shall then verify this "take-off" using an "FBO Form B: Take Off Confirmation Sheet".
- D. Receipt Of Shipment: Contractor shall verify shipment per the requirements of Section 01010 and complete the "FBO Form C: Confirmation of Shipment" and submit back to the FBO vendor.
- E. Request for Changes: Changes to materials and quantities after receipt of shipment shall be coordinated by the contractor with the FBO vendor per the requirements of Section 01010 using an "FBO Form D: Request For Additional/Replacement Materials".
- F. Return Merchandise Authorization Policy: The Home Depot will add to the contractors' scope of work the responsibility for coordinating (1) customer accommodation return request through the FBO Vendor. Requests shall be submitted using the "FBO Form E: Returned Materials" as specified in Section 01010.

**1.03 SUBMITTALS TO ARCHITECT OF RECORD**

- A. Submit shop drawings under provisions of Section 15010 and 01300.
- B. Submittal data shall include detail unit component description, accurate piping connections and unit control and power wiring diagram.

**1.04 WARRANTY**

- A. The manufacturer shall provide a five (5) year limited warranty on the burner and all electrical and mechanical operating components and a ten (10) year limited warranty on the tubes.

**PART 2 - PRODUCTS****2.01 ACCEPTABLE MANUFACTURER**

- A. Reznor (No Substitution)
- Lennox Industries is the sole supplier

**2.02 LOW INTENSITY RADIANT HEATERS**



**Construction Specification****(FBO) LOW INTENSITY RADIANT HEATERS (LENNOX-REZNOR)**

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- A. The burner/control box and tubular system shall be designed for horizontal suspension from field-supplied hanging chains.
- B. The burner control system shall have a 24-volt transformer; a multi-try direct spark ignition with 100% lockout; single-stage combination gas valve; LED diagnostic light; sight glass for observing flame; a power burner with pre-purge and post purge; a differential air pressure switch to measure combustion air; and a terminal board for connection of remote (unit mounted) thermostat. Electrical supply connection is with a grounded, plug-in cord. Gas connection to the valve must be with field-supplied expansion coil or approved flexible connector.
- C. The tubular system shall include a 16-gauge aluminized steel combustion chamber, high emissivity radiant heat exchanger tubes, turbulator strips, wire form suspension hangers, compression coupling tube connections, and polished aluminum overlapping reflectors with reflector retainers. Heater may be individually (or dual) vented horizontally or vertically and may operate on either inside (or outside) combustion air. Reflectors may be positioned from horizontal to 45° angle. Horizontal reflectors may include optional side shield, and optional end covers. All connection hardware kits shall be packaged in individual bags and include illustrated instructions.

**2.03 ACCUSTAT (as required by construction drawings)**

- A. Provide (1) wall mounted thermostats (Honeywell T451A) to control the low intensity radiant heater. Provide factory pre-set sensor for 60°F (heating).

**PART 3 - EXECUTION****3.01 INSTALLATION**

- A. Installation of equipment shall be per manufacturer's recommendations.

**3.02 STARTUP AND COMMISSIONING**

- A. Refer to Section 15960 - Energy Management Controls and Commissioning

**END OF SECTION**

**PART 1 - GENERAL****1.01 SUMMARY**

- A. This section covers factory equipped Novar ETM gas heat and electric cooling or cooling only rooftop units.
- B. Units shall be certified in accordance with ARI Standards.
- C. Unit shall be tested and certified with factory installed Novar ETM in accordance with AGA safety requirements as a total package.
- D. Unit shall be UL listed and tested with factory installed Novar ETM in accordance with UL465.
- E. General provisions and mechanical systems are specified in other sections of Division 15.
- F. Related Work specified elsewhere includes but not limited to:
  - 1. Section 01010 - Furnished By Owner Items (FBO)
  - 2. Section 07720 - Manufactured Structural Roof Curbs
  - 3. Section 15880 - Air Distribution
  - 4. Section 15952 - Controls
  - 5. Section 15960 - Energy Management Controls and Commissioning

**1.02 FBO PROCEDURES**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section. General requirements related to Furnished by Owner (FBO) Items are as defined in Section 01010. All FBO Forms listed below are included as part of Section 01010.
- B. Vendor Contact: Contractor shall send a completed "FBO Form A: Contractor Information Form" to the FBO vendor indicated below, twelve (12) weeks prior to the scheduled installation of the specified system:

Lennox Industries  
105 Summer Breeze Glen  
Sugar Hill, GA

National Accounts: Walker Roth  
Office: (404) 759-4878; Fax: (none)  
E-Mail: [walker.roth@Lennoxind.com](mailto:walker.roth@Lennoxind.com)

Pricing and Ordering: Derek Garen  
Office: (800) 367-6285; Fax: (none)  
E-Mail: [Derek.garen@lennoxind.com](mailto:Derek.garen@lennoxind.com)
- C. Take-Offs: FBO Vendor shall provide "take-offs" to the Contractor as specified in Section 01010. The Contractor shall then verify this "take-off" using an "FBO Form B: Take off Confirmation Sheet".
- D. Receipt of Shipment: Contractor shall verify shipment per the requirements of Section 01010 and complete the "FBO Form C: Confirmation of Shipment" and submit back to the FBO vendor.
- E. Request for Changes: Changes to materials and quantities after receipt of shipment shall be coordinated by the contractor with the FBO vendor per the requirements of Section 01010 using an "FBO Form D: Request For Additional/Replacement Materials".
- F. Return Merchandise Authorization Policy: The Home Depot will add to the contractors' scope of work the responsibility for coordinating (1) customer accommodation return request through the FBO Vendor. Requests shall be submitted using the "FBO Form E: Returned Materials" as specified in Section 01010.

**1.03 SUBMITTALS TO ARCHITECT OF RECORD**

- A. Submit shop drawings under provisions of Section 15010.
- B. Submittal data shall include detail unit component description, accurate piping connections and unit control and power wiring diagram.

**1.04 WARRANTY**

- A. Unit shall be warranted for one (1) year and heat exchanger for five (5) years. Provide extended five (5) year warranty on compressor beginning at Grand Opening.

**PART 2 - PRODUCTS**

**2.01 ACCEPTABLE MANUFACTURER**

- A. Lennox Industries

**2.02 ROOFTOP UNITS**

- A. Units shall be certified in accordance with ARI Standards, UL listed as a total package for safety requirements and shall be tested and certified in accordance with AGA safety requirements as a total package.
- B. The units shall be air-to-air electric cooling and gas heating, or cooling only as scheduled on the mechanical drawings.
- C. The units shall be designed for roof mounting outdoors and shall consist of Novar ETM with Novar supply air sensor (range - 20 to 170 degrees), Novar return air sensor (range - 20 to 120 degrees), compressor(s), condenser(s), evaporator coil(s), heat exchanger, condenser and evaporator fan(s), refrigeration and temperature controls, filters, low and high pressure cutouts, short cycling protection, overcurrent, overtemperature, outdoor air dampers, econo dampers and motor, controls by Novar only and sloped roof curb.
- D. The units shall be configured for through-the-base electrical connection with a factory-provided, 3-pole, disconnect switch. The disconnect switch shall be mounted in the unit in a weather-proof enclosure with access through a hinged door. The units shall be factory wired from the disconnect switch to the high voltage terminal block.
- E. Each unit shall be provided with a 2-receptacle, GFCI, 120V/15A convenience outlet. The outlet shall be factory-provided with a separate disconnect switch and powered from the line side of the main unit disconnect switch.
- F. The cabinet shall be constructed of galvanized steel, phosphatized with a baked enamel finish and removable access panels. Cabinet interior shall be insulated with 1/2" thick, 1-pound insulation. A sloped drain pan shall be provided for the evaporator coil along with a condensate drain connection.
- G. The units shall contain scroll compressor(s) with direct drive operating at 3600 rpm, with integral centrifugal oil pump. The motor shall be suction gas-cooled with winding temperature limits and compressor overloads. Units shall be capable of operating at outdoor temperatures down to 0 degrees Fahrenheit without additional controls.
- H. The evaporator fan shall be forward curved, double width, double inlet, centrifugal type capable of delivering the required cfm at the external static pressure as specified in the equipment schedule. The evaporator fan shall be belt-driven with adjustable motor sheave. Condenser fans shall be of the propeller type, direct drive, statically and dynamically balanced, draw-through in the vertical discharge position. All fan motors shall be permanently lubricated and have internal thermal overload protection.
- I. The heating section for units 10 tons and smaller shall have a progressive tubular design using stainless steel burners and corrosion resistant steel throughout, with a direct spark ignition system. The heating section (where scheduled) for units larger than 10 tons shall have a drum and tube heat exchanger design using corrosion resistant steel components, with a pilotless hot surface ignition system. All units shall be of induced-draft combustion type with redundant main gas valve and 2-stage heat. Heating controls shall include purge cycle and combustion air proving prior to ignition, continuous flame supervision, flame rollout switches and high-temperature limit switches. The blower motor shall have built-in thermal overload protection.
- J. Evaporator and condenser coils shall be aluminum plate fins mechanically bonded to copper tubes with all joints brazed. Coil shall be designed for equal circuit loading and full active coil on part-load operation.
- K. Structural Roof curb, provided by RTU manufacturer, as specified under section 07720.
- L. Safety Controls: Cooling section shall be protected against low pressure, high pressure, loss of charge, overtemperature and shall have compressor motor overload protection. Provide lock-out circuit that will prevent compressor restart on a trip on any safety device until manually reset. Provide anti recycling control to prevent compressor short cycling as a result of a rapid change in thermostat setting or power outage, automatically preventing compressor restart for five (5) minutes after shutdown. Provide evaporator coil freeze protection.
- M. Where indicated on the drawing, unit shall be furnished with 100% modulating outside air economizer package including dampers, motor, and gravity relief dampers. Drybulb economizer shall have low leak dampers rated at 3% at 1 inch static pressure, contain spring return motor to close dampers during power off. Economizer shall be capable of integrated operation to allow simultaneous mechanical cooling. Control of damper motor will be by Novar ETM. Economizer shall function as follows:
  - 1. On a call for cooling and with outside air temperature less than return air temperature, outside air damper shall fully open and return air damper shall be fully closed.

**PART 3 - EXECUTION****1.01 EXAMINATION**

- A. Examine substrates, areas, and conditions, with installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of RTUs.
- B. Examine roughing-in for RTUs to verify actual locations of piping and duct connections before equipment installation.
- C. Examine roofs for suitable conditions where RTUs will be installed.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.02 INSTALLATION

- A. Installation of equipment shall be per manufacturer's recommendations.

### 3.03 CONNECTIONS

- A. Install condensate drain, minimum connection size, with trap and indirect connection to nearest roof drain or area drain.
- B. Install piping adjacent to RTUs to allow service and maintenance.
  - 1. Gas Piping: Comply with applicable requirements in Section 15400. Connect gas piping to burner, full size of gas train inlet, and connect with union and shutoff valve with sufficient clearance for burner removal and service.
- C. Duct installation requirements are specified in Section 15880. Drawings indicate the general arrangement of ducts. The following are specific connection requirements:
  - 1. Install ducts to termination at top of roof curb.
  - 2. Remove roof decking only as required for passage of ducts. Do not cut out decking under entire roof curb.
  - 3. Connect supply ducts to RTUs with flexible duct connectors as specified in Section 15880.
  - 4. Install return-air duct continuously through roof structure.

### 3.04 STARTUP AND COMMISSIONING

- A. Refer to Section 15960 - Energy Management Controls and Commissioning
- B. Mechanical Contractor to complete attached RTU "Equipment Startup Checklist" for each RTU and fax to the Energy Management System Controls Contractor –PRIOR TO TURNOVER DATE.

Energy Management System Controls Contractor (EMSCC)  
Entek Inc.  
5177 Bellewood Court, Suite A  
Buford, GA 30518  
Phone: 770-449-1222  
Fax: (none)

### 3.05 CLEANING

- A. After completing system installation and testing, adjusting, and balancing RTU and air-distribution systems, clean filter housings and install new filters. Throw away filters shall be replaced with 2" pleated filters at job turn-over and grand opening.

**Equipment Startup Checklist**

Store # \_\_\_\_\_ Date \_\_\_\_\_ RTU # \_\_\_\_\_ Outdoor Air Temperature \_\_\_\_\_

Make and Model		
Serial Number		
Tonnage		
RTU label nameplates installed and RTU number painted on drum louver?		
Gas and Condensate lines clear of all access doors?		
Drain Lines Installed per Drawings?		
Outside Air Damper Installed?		
Condenser Coil Condition – comb any bent areas.		
Verify Condenser Fan Operation		
Condenser Fan Nameplate Amps	Fan 1	Fan 2
Condenser Fan Actual Amps	Fan 1	Fan 2
Number of Filters and Size		
Verify Evaporator Fan Operation		
Evaporator Fan Nameplate Amps		
Highest Leg Running Amps		
Belt Tension & Alignment ok?		
Minimum Damper position set to zero or as drawings dictate		
Number of Cooling Stages		
Compressor Nameplate Amps	Comp 1	Comp 2
Compressor Amps – Highest Leg	Comp 1	Comp 2
Compressor Run Voltage		
Discharge Line Temperature	Comp 1	Comp 2
Suction Line Temperature	Comp 1	Comp 2
Return Air Temperature		
Supply Air Temp – all stages running		
Number of Heating Stages		
Return Air Temperature		
Supply Air Temp – all heating stages running		
Economizer Operation Verified through Novar ETM Controller		
Power Exhaust Operation Verified		

END OF SECTION

**PART 1 - GENERAL****1.01 SUMMARY**

- A. This Section includes the furnishing and installation of fans and accessories.
  - 1. Centrifugal Roof Ventilators
  - 2. Sidewall Propeller Fans
  - 3. In-line Fans
  - 4. Smoke Exhaust Fans (if scheduled)
  - 5. Gravity Ventilators
- B. General Provisions and Mechanical Systems are specified in other Sections of Division 15.
- C. Related Work specified elsewhere includes but not limited to:
  - 1. Section 01010 - Furnished By Owner Items (FBO)

**1.02 FBO PROCEDURES**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section. General requirements related to Furnished by Owner (FBO) Items are as defined in Section 01010. All FBO Forms listed below are included as part of Section 01010.
- B. Vendor Contact: Contractor shall send a completed "FBO Form A: Contractor Information Form" to the FBO vendor indicated below, twelve (12) weeks prior to the scheduled installation of the specified system:

Lennox Industries  
105 Summer Breeze Glen  
Sugar Hill, GA

National Accounts: Walker Roth  
Office: (404) 759-4878; Fax: (none)  
E-Mail: [walker.roth@lennoxind.com](mailto:walker.roth@lennoxind.com)

Pricing and Ordering: Derek Garen  
Office: (800) 367-6285; Fax: (none)  
E-Mail: [Derek.garen@lennoxind.com](mailto:Derek.garen@lennoxind.com)
- C. Take-Offs: FBO Vendor shall provide "take-offs" to the Contractor as specified in Section 01010. The Contractor shall then verify this "take-off" using an "FBO Form B: Take Off Confirmation Sheet".
- D. Receipt Of Shipment: Contractor shall verify shipment per the requirements of Section 01010 and complete the "FBO Form C: Confirmation of Shipment" and submit back to the FBO vendor.
- E. Request for Changes: Changes to materials and quantities after receipt of shipment shall be coordinated by the contractor with the FBO vendor per the requirements of Section 01010 using an "FBO Form D: Request For Additional/Replacement Materials".
- F. Return Merchandise Authorization Policy: The Home Depot will add to the contractors' scope of work the responsibility for coordinating (1) customer accommodation return request through the FBO Vendor. Requests shall be submitted using the "FBO Form E: Returned Materials" as specified in Section 01010.

**1.03 SUBMITTALS TO ARCHITECT OF RECORD**

- A. Submit shop drawings under provisions of Section 15010 and 01300.
  - 1. Submit with shop drawings, operating point plotted on curves.
- B. Submit manufacturer's installation instructions under provisions of Section 15010.

**1.04 WARRANTY**

- A. The manufacturer shall provide a one (1) year limited warranty on the unit.

**PART 2 - PRODUCTS****2.01 ACCEPTABLE MANUFACTURER**

- A. Greenheck

Lennox Industries is the sole supplier

## **2.02 FANS - GENERAL**

- A. All fans shall be AMCA certified for performance and sound and shall bear the AMCA label.
- B. Fans shall be of the capacity, size, accessories and arrangement as scheduled. The fan's design is based on the manufacturer and model specified and/or scheduled. Fans shall be furnished with guards, disconnect switch, bird screens, dampers, isolators, motors, curb flashing and other accessories as specified and/or scheduled and shall be completely operable after installation. Contractor shall coordinate with electrical when motor sizes are different from those scheduled.
- C. Equivalent fan selection shall not increase motor horsepower, noise level, or tip speed by more than 10%, or increase inlet air velocity by more than 20%, from that specified.
- D. All fans shall be UL listed for the service and use indicated.

## **2.03 CENTRIFUGAL ROOF VENTILATORS**

- A. Fans shall be of the centrifugal roof mounted type with an all welded flashing type curb base, belt or direct driven type as scheduled. Wheels shall be statically and dynamically balanced to assure smooth and vibration free operation. Entire drive assembly shall be mounted on vibration isolators. Motors shall be of the heavy duty type with permanently lubricated, sealed ball bearings and shall be mounted out of the air-stream. Cooling air for the motor shall be drawn into the motor compartment through an opening between the fan shroud and the motor compartment. Fans shall be provided with birdscreen, back draft damper, disconnect switch and roof curb. An electrical conduit shall be provided through the fan base into motor compartment to facilitate wiring.

## **2.04 SIDEWALL PROPELLER FANS**

- A. Fan shall be of the sidewall, belt-driven, propeller type. The drive frame and panel assemblies shall be of bolted, galvanized steel construction. Drive frame shall be constructed of formed channels. Panels shall have pre-punched mounting holes, formed flanges and a deep formed inlet venturi. The propeller shall be constructed of fabricated steel blades and hub, statically and dynamically balanced. The fan shaft shall be of ground and polished steel mounted in permanently lubricated, sealed ball bearing pillow blocks. Motor shall be permanently lubricated, heavy duty type. Fan shall be provided with wall housing, wall housing guard, damper guard (no damper) and disconnect switch.

## **2.05 IN-LINE FANS**

- A. Fan shall be of the in-line, belt-driven, centrifugal type. Fan housing shall be constructed of heavy gauge galvanized steel and shall include duct mounting collars and removable access panels. The fan wheel shall be of the centrifugal backward-inclined type, aluminum construction, statically and dynamically balanced. The fan shaft shall be of ground and polished steel mounted in permanently lubricated, sealed ball bearing pillow blocks. Motor shall be heavy duty, ball bearing type and shall be mounted out of the air-stream. Fan shall be provided with NEMA-3R disconnect switch.

## **2.06 SMOKE EXHAUST FANS (IF SCHEDULED)**

- A. Fans shall be of the roof-mounted, belt-driven, tube axial type and shall meet the requirements for UL Listed "Power Ventilators for Smoke Control Systems" including IRI requirements for operation at 500°F for four hours, SBCCI "Standard Fire Prevention Code" requirements for operation at 1000°F for 15 minutes and UL-793 Snow Load Test for butterfly dampers. Fan tube and curb cap shall be constructed of heavy gauge steel with heavy gauge welded steel reinforcing gussets and integral venturi inlet. Curb cap shall have pre-punched mounting holes. Windbands shall be constructed of heavy gauge painted steel with reinforced edges. The propeller shall be constructed of fabricated steel, statically and dynamically balanced. The fan shaft shall be of ground and polished steel mounted in grease lubricated ball bearing pillow blocks. Extended lubrication lines shall be provided with external grease fittings. Motor shall be heavy duty, ball bearing type and shall be mounted out of the air-stream with a vented, weatherproof cover. Fan shall be provided with NEMA-3R disconnect switch.

## **2.07 GRAVITY VENTILATORS**

- A. Gravity ventilator shall be of low-profile design, suitable for natural gravity or positive pressure application. Housing and curb cap shall be of aluminum construction. Curb cap shall have pre-punched mounting holes. Ventilator shall be provided with gravity damper, roof curb and in-frame insect screen.

# **PART 3 - EXECUTION**

## **3.01 INSTALLATION**

- A. Supply and install sheaves as necessary for final air balancing.

- B. Set roof mounted fans on curbs. Provide acoustic insulation on duct to below roof line and on fan inlet plenum and drip pan for collecting condensation.

END OF SECTION



**PART 1 - GENERAL****1.01 DESCRIPTION**

- A. General Provisions and Mechanical Systems are specified in other Sections of Division 15.
- B. This Section covers air distribution systems and equipment.
- C. Air conditioning units are specified in another Division of the work.

**1.02 DEFINITIONS**

- A. All ductwork shall be considered low pressure, with a static pressure rating of 1" and maximum velocity of 2000 FPM.

**PART 2 - PRODUCTS****2.01 SHEET METAL WORK, GENERAL**

- A. Provide offsets, elbows and transformations to coordinate with other work. Changes in shape or dimension shall be made with a maximum slope of 1 to 4.
- B. Ducts over 12" in either dimension shall have all sides cross broken or machine formed transverse beads spaced not over 12 inches on center.
- C. Elbows ductwork shall have an inside radius equal to the width of the duct, except where otherwise shown or necessitated by space conditions. Where inside radius is less than  $\frac{3}{4}$  duct width, provide multiple turning vanes. Square elbows shall be provided with turning vanes, single thickness.
- D. Ductwork construction shall conform to SMACNA Duct Construction Standards.
- E. Connections of ductwork to vibrating machinery shall be isolated with a flexible duct connection by Duro-Dyne, or equal by Ventfab.

**2.02 DUCT LINING**

- A. Line all rectangular ducts as specified in 15250.

**2.03 DUCT SEALING COMPOUND**

- A. UL listed, manufactured to comply with NFPA 90A.

**2.04 HANGERS AND SUPPORTS**

- A. Hang horizontal duct by galvanized steel strap,  $\frac{1}{8}$ " x 1" for ducts 48 inches or smaller;  $\frac{1}{8}$ " x  $1\frac{1}{4}$ " on larger ducts with 1 inch hook turned under bottom of duct.

**2.05 FLEXIBLE DUCTWORK**

- A. Provide low pressure flexible ductwork factory insulated with 1" thick fiberglass with vapor barrier jacket. Flexible duct between supply ductwork and air diffusers full size of connection. Flame spread rating not over 25, smoke developed rating not over 50, Cleveaflex, Fiberglass, Flexmaster, Genflex, Thermaflex or Wiremold.
- B. Flexible ductwork shall be metalized polyester over galvanized steel wire or vinyl impregnated fiberglass on Tedlar covered steel helix or spiral. Operating pressure 6" positive and 1" negative.
- C. Flexible ductwork shall not exceed 5'-0" in length. For longer branches, use rigid round ductwork with external duct wrap insulation.

**2.06 SINGLE BLADE DAMPERS**

- A. Rectangular volume dampers in branch ducts shall be 22 gage galvanized steel frame and blade.
- B. Round volume dampers in branch ducts shall be 20 gage galvanized steel frame and blade.
- C. When in open position, round damper blades shall not extend beyond damper frame.
- D. Maximum blade size of rectangular dampers shall be 36" wide x 12" high.
- E. Damper shall be manufactured by Ruskin, Inc. Or approved equal.

**2.07 MULTI BLADE DAMPERS**

- A. Blades: Minimum 16 gauge galvanized steel, opposed blade type, edges crimped to interlock in closed position:
  - 1. Pivot Rods: Steel, minimum ½" diameter or hex, 6" long. One (1) rod extended to permit operation of damper from outside duct.
  - 2. Maximum size 48" wide by 72" high with 6" blades.
  - 3. Dampers opening to the outside shall have neoprene or polyurethane seals.
- B. Frames: Galvanized steel, bar or channel, minimum 2" wide x ⅛" thick, 16 gauge galvanized roll formed channel with double thickness edges.
  - 1. Corner bracing.
  - 2. Full size of duct or opening in which installed.
- C. Dampers shall be provided with cadmium-plated steel quadrant with device for locking damper in position and marked frame indicating damper position, Duro-Dyne KL-7R, or Ventlok 560.
- D. Finish On All Steel Parts: Galvanized.

## **2.08 GRILLES, REGISTERS AND DIFFUSERS**

- A. Layout is based on products by Titus, as identified on the Drawings. Equal products by Price, Carnes, Anemostat, Krueger, MetalAir, Tuttle & Bailey and J & J Register will be considered.
- B. Ceiling diffusers shall be arranged to suit the ceiling type shown on the Architectural drawings.

## **2.09 FIRE DAMPERS**

- A. Layout is based on products by Greenheck. Equal products by Ruskin, Safe-Air, Inc., or Louvers & Dampers are acceptable. Blade shall be out of airstream, curtain style.
- B. Dampers are to be dynamic type, and rating is to match partitions in which it is installed. Must carry UL555 rating.

## **2.10 ROUND DUCT TAKE-OFFS FROM ROUND DUCT**

- A. Round duct take-offs from round duct mains shall be accomplished with pre-manufactured fittings. Acceptable fittings are wyes and 45/90 boot type. Acceptable manufacturer shall be Sheet Metal Product Co. or approved equal.

## **2.11 DROP BOX DIFFUSERS**

- A. Drop box assembly shall be constructed of 18-gauge galvanized steel and shall be shipped to construction site complete with 1" top flange, 1" acoustical duct liner insulation, air diverter pyramid, four (4) fully adjustable double-deflection drum louvers, and mounting brackets for field installation. The Contractor shall provide duct transitions as required to complete the installation.
- B. Drum louvers shall be manufactured by Curbs Plus. An acceptable alternate manufacturer is AES Industries, Inc.
- C. Drop boxes shall be shop primed and finished. Finish coating shall be "Standard White".
- D. Drop boxes shall be shipped with a schedule referencing each drop box with its associated HVAC rooftop unit (RTU).

## **PART 3 - EXECUTION**

### **3.01 SHEET METAL WORK, GENERAL**

- A. Separate galvanized sheet metal from aluminum or copper with lead or felt gaskets.
- B. Provide supplemental stiffening and supports to ducts and apparatus casings to prevent drumming and sagging and to provide a structurally sound assembly.
- C. Interior of ducts shall be smooth. All transverse and longitudinal joints in ductwork shall be sealed if required to make air tight with duct sealer. The entire air system installation shall be rigid, free from rattles and air noises.

### **3.02 SHEET METAL WORK**

- A. Fasten flexible ductwork to fittings and diffusers with steel draw bands and duct tape.

### **3.03 DUCT LINING**

- A. Install lining with coated side facing air stream. Adhere liner to inside of duct with 100% coverage of adhesive. Mechanical fasteners, similar to Graham welded pins shall be used at maximum 16" on center on top sections over 12" wide and side sections over 24" high. Coat exposed edges and joints with edge sealer.
- B. Protect leading edges against flaking by 24 gauge galvanized metal protectors. Butt edges of lining tightly together to form a continuous thermal barrier. Refer to Section 15250 for liner specification.

#### 3.04 HANGERS AND SUPPORTS

- A. Support horizontal ductwork not more than 8' on center. Support round ductwork with straps and hangers as recommended by the manufacturer and SMACNA.
- B. Where ducts are suspended directly from the structure, screw or pop-rivet hangers to the bottom and sides of the duct and secure to the structure with beam clamps or welding.

#### 3.05 FLEXIBLE DUCTWORK

- A. Install flexible ductwork in a fully extended condition, free of sags and kinks, using the minimum length required to make connection. Seal joints with duct sealing compound. Maximum length of flexible ducts shall be 5'. Use round galvanized duct, same size as flexible duct, for runouts longer than 5'.
- B. Unless otherwise shown, flexible ductwork shall be the same diameter as the diffuser neck to which it connects.

#### 3.06 DROP BOX DIFFUSERS

- A. Install in accordance with instructions and as indicated on drawings.
- B. Coordinate with the drop box diffuser assembly manufacturer to provide adequate sizing based on air flow rates of the various RTUs. Fabrication shall not commence prior to shop drawing approval.
- C. Drum louvers shall be protected from weather, painting operations and all other conditions that might restrict the free movement of the drum louver within the drop box assembly.
- D. The drop box diffuser assembly shall be guaranteed to be free from defects in material or workmanship for a period of five (5) years.

END OF SECTION

**PART 1 - GENERAL****1.01 SUMMARY**

- A. Refer to Section 15010, provisions of which apply to work under this Section
- B. Scope of Work:
  - 1. Energy Management Systems (EMS) Controls Wiring:
    - a. Electrical Contractor responsible for providing and installing: Conduit, Boxes, and Low Voltage Wiring per the requirements of Section 16125
    - b. Energy Management System Controls Contractor (EMSCC) is responsible for all EMS Low Voltage Wiring final connections and terminations
- C. A complete energy management system has been designed for this Home Depot Store. Materials will be supplied in part by the Owner where indicated by FBO. Mounting of controls devices shall be performed by the EMSCC. Routing of low voltage wiring to the Energy Management System Panel and devices shall be performed by the Electrical Contractor. Final termination to the devices shall be by the EMSCC.
- D. Where scheduled, all RTUs shall be provided with Novar modules (as specified on drawings). See plans for individual method of control.
- E. Final connection of communication wiring into Novar modules is by the Energy Management System Controls Contractor (EMSCC), refer to drawings.
- F. For control devices furnished with equipment, refer to equipment specifications and construction drawings.
- G. Installing Contractor shall maintain adequate automatic control personnel on his payroll to provide back-up project control service on the automatic control system provided under this contract.
- H. Related Work specified elsewhere includes but not limited to:
  - 1. For extent of wiring and connection under Electrical Work, refer to Division 16 and construction drawings-
  - 1. Section 01010 - Furnished By Owner Items (FBO)
  - 2. Section 15010 - Mechanical General Requirements
  - 3. Section 15610 - Unit Heaters
  - 4. Section 15730 - Rooftop Units
  - 5. Section 15960 - Energy Management Controls and Commissioning
  - 6. Section 16120 - Wires and Cables
  - 7. Section 16125 - Low-Voltage Wiring
  - 8. Section 16400 - Service and Distribution
  - 9. Section 16720 - Fire Alarm System

**1.02 FBO PROCEDURES**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section. General requirements related to Furnished by Owner (FBO) Items are as defined in Section 01010. All FBO Forms listed below are included as part of Section 01010.
- B. Vendor Contact: Contractor shall send a completed "FBO Form A: Contractor Information Form" to the FBO vendor indicated below, twelve (12) weeks prior to the scheduled installation of the specified system:
  - 1. EMS Equipment Supplier:
    - Novar Controls
    - 6060 Rockside Woods Blvd., Suite 400
    - Cleveland, OH 44131
    - Contact: Ben Brown
    - Mobile: (905) 379-2693
    - E-Mail: [ben.brown@novar.com](mailto:ben.brown@novar.com)
    - Additional 24 hour contact:
    - Phone: (800) 348-1236
    - Fax: (800) 845-6621

2. Energy Management System Controls Contractor (EMSCC):

Entek  
5177 Bellewood Court, Suite A  
Buford, GA 30518  
Contact: John Walker  
Office: (770) 449-1222  
Fax: (678) 318-3170  
E-Mail: jwalker@entek-inc.com

- C. Take-Offs: FBO Vendor shall provide "take-offs" to the Contractor as specified in Section 01010. The Contractor shall then verify this "take-off" using an "FBO Form B: Take-Off Confirmation Sheet".

1.03 WARRANTY

- A. Contractor shall warranty all work performed under this contract to be free of any defects in workmanship or material for a period of one (1) year from Grand Opening.

PART 2 - PRODUCTS

2.01 CONTROL PRODUCTS SUPPLIED BY OTHER SECTIONS

- A. Section 16400 - Service and Distribution: Controls products supplied under this section and shipped to the Switchgear supplier to be included in their shipment to the store include, but are not limited to:
1. Sensors
  2. Savvy Panel
  3. Outside Air Mast Assembly

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Division 16, ELECTRICAL, shall be responsible for point to point wiring of all starters and starting switches not factory installed in the HVAC equipment.
- B. Install all components of control systems under this Section using experienced control mechanics, all in the regular employ of the installing Contractor, or the apparatus manufacturer.

3.02 WIRING

- A. Install all control, pilot circuit and interlock wiring, including wiring through interposed safety or other auxiliary non-EMS control devices within the confines of the mechanical equipment only. See construction drawings for specific responsibilities of wiring the mechanical equipment. Termination wiring of Novar sensors on unit heaters and office rooftop units shall be by the EMSCC contractor.
- B. All line voltage control wiring shall be run in electrical conduit.
- C. All wiring shall conform to the Local and National Electrical Codes.
- D. All control and interlock wiring shall be fused at conductor capacity as shown in the National Electrical Code.
- E. No splices shall be used except where called out specifically in the drawings.
- F. All wires to each control device shall be different colors. All wires to each device shall be laced or tied at point of entry into control panel and tagged as to its point of origin.
- G. All wires shall be run directly from controller or controlled device to control center. Any exceptions will be noted on the construction drawings.
- H. Control voltage shall be a maximum of 120 volt, unless otherwise indicated herein.
- I. Control or interlock wiring shall not be run in conduit with any power wiring other than that serving the equipment controlled.
- J. Refer to Division 16, ELECTRICAL, for extent of work under that Division. Provide other wiring systems required to accomplish the work of this Section, following requirements of Division 16 for products and execution.
- K. Wiring connections to terminal posts shall be made by means of compression type lugs. Wire splices, where permitted, shall be made with sketch locks.

- L. Safety devices in motor control circuits shall be wired to interrupt the holding coil circuit regardless of the position of any selector switches in the circuit.
- M. Control circuit conductors shall be sized for a maximum voltage drop of 10% of the circuit voltage.
- N. All electrical power wiring shall conform in all respects with the provisions of the National Electrical Code and Division 16, ELECTRICAL, of these Specifications.
- O. Provide all necessary contactors, switches, transformers to accomplish operating sequences.

**3.03 SYSTEM CHECK-OUT**

- A. Check-out each system for control function through entire sequence, check calibration of instruments, reset instrument control points, as defined in Section 15960.
- B. The Contractor shall ensure the Owner's maintenance personnel are thoroughly familiar, by the Contractor, with the operation and service of the project temperature control circuits.

**3.04 STARTUP AND COMMISSIONING**

- A. Refer to Section 15960 - Energy Management Controls and Commissioning

**END OF SECTION**

**Construction Specification (FBO) ENERGY MANAGEMENT CONTROLS AND COMMISSIONING****PART 1 - GENERAL****1.01 SUMMARY**

- A. This Section covers Energy Management Controls and Commissioning process. Energy Management Equipment Supplier shall be Novar controls. No alternate supplier may be provided without approval from Home Depot.
- B. Scope of Work:
  - 1. Energy Management System (EMS) Controls Wiring:
    - a. Electrical Contractor responsible for providing and installing: Conduit, Boxes, and Low Voltage Wiring per the requirements of Section 16125
    - b. Energy Management System Controls Contractor (EMSCC) is responsible for all EMS Low Voltage wiring final connections and terminations except in areas where local labor jurisdictions claim responsibility for the work. In this case the terminations shall be done by the EC and supervised by the EMSCC.
- C. Home Depot shall hire the services of an Energy Management System Controls Contractor (EMSCC) for the commissioning and Equipment Performance Check (EPC) of all equipment requiring controls. The first commissioning visit shall be conducted as soon as reasonably possible to building possession date but no sooner than building possession date and shall consist of five (5) days on-site. The second commissioning visit shall take place approximately ten (10) days prior to grand opening and shall consist of two (2) days on-site. Travel time to and from the site shall not be included as time on-site. The intent of the commissioning process is to eliminate all punch list items prior to the contractor leaving the job site.
- D. General Provisions related to EMS Controls, Electrical and Mechanical systems are specified in other Sections of Division 15 and 16 as well as on the construction drawings.
- E. Related Work specified elsewhere includes but not limited to:
  - 1. Section 01010 - Furnished By Owner Items (FBO)
  - 2. Section 01300 - Submittals
  - 3. Section 15010 - Mechanical General Requirements
  - 4. Section 15610 - Unit Heaters
  - 5. Section 15730 - Rooftop Units
  - 6. Section 15952 - Controls
  - 7. Section 16120 - Wires and Cables
  - 8. Section 16125 - Low-Voltage Wiring
  - 9. Section 16400 - Service and Distribution

**1.02 FBO PROCEDURES**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section. General requirements related to Furnished by Owner (FBO) Items are as defined in Section 01010. All FBO Forms listed below are included as part of Section 01010.
- B. Vendor Contact Information: General, Electrical, and Mechanical Contractor shall send a completed "FBO Form A: Contractor Information Form" to the EMS Equipment Supplier indicated below, twenty-two (22) weeks prior to the scheduled installation of the specified system. Smart Panel Fabricator shall send a completed "FBO Form A: Contractor Information Form" to the EMS Equipment Supplier indicated below, twenty-two (22) weeks prior to the scheduled installation of the specified system.
  - 1. EMS Equipment Supplier:  
 Novar Controls  
 6060 Rockside Woods Blvd.  
 Cleveland, OH 44131  
 Contact: Ben Brown  
 Mobile: (905) 379-2693  
 Fax: (800) 845-6621  
 E-Mail: ben.brown@novar.com
  - 2. Energy Management System Controls Contractor (EMSCC):  
 Entek  
 5177 Bellewood Court, Suite A  
 Buford, GA 30518  
 Contact: John Walker  
 Office: (770) 449-1222  
 Mobile: (770) 540-8856  
 Fax: (678) 318-3170  
 E-Mail: jwalker@entek-inc.com
- C. Take-Offs: EMS Equipment Supplier shall provide "take-offs" to the Contractor as specified in Section 01010. The Contractor shall then verify this "take-off" using an "FBO Form B: Take-Off Confirmation Sheet".

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**Construction Specification (FBO) ENERGY MANAGEMENT CONTROLS AND COMMISSIONING**


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**PART 2 - PRODUCTS (Not Applicable)****PART 3 - EXECUTION****3.01 GENERAL CONTRACTOR REQUIREMENTS**

- A. General Contractor shall confirm that all applicable trades have completed all items on the "Energy Management Commissioning Pre-Visit Check-Off Sheet" prior to building possession date. EMSCC shall contact General Contractor two weeks prior to building possession date to confirm the progress of completing the required items. Home Depot Project Manager has the right to reschedule the first Commissioning visit with EMSCC without penalty if extenuating circumstances arise given reasonable notice from General Contractor.
- B. General Contractor shall post to Expesite a completed "General Contractor Energy Management Commissioning Pre-Visit Check-Off Sheet" from Section 15960, page 5, with notification to the EMSCC and Home Depot Project Manager at building possession date minus one week.
- C. General Contractor shall make available the completed "General Contractor Energy Management Commissioning Pre-Visit Check-Off Sheet" to EMSCC upon EMSCC's first day of arrival for store commissioning.
- D. The EMSCC shall evaluate the status of the items identified on the "General Contractor Energy Management Commissioning Pre-Visit Check-Off Sheet" upon the first day of arrival of commissioning. Failure of the job's contractors to substantially complete the items identified on the "General Contractor Energy Management Commissioning Pre-Visit Check-Off Sheet" shall constitute grounds for an aborted first commissioning trip. If the job is substantially incomplete the EMSCC may recommend to Home Depot Project Manager that the first commissioning visit be aborted and rescheduled at a later date. In this event Home Depot reserves the right to bill General Contractor an aborted first commissioning trip fee of \$1,800 that shall include all labor and expenses of EMSCC.
- E. If the job requires the EMSCC to spend additional days beyond the seven paid for by Home Depot, then Home Depot reserves the right to bill General Contractor for EMSCC's additional time and expense. A rate of \$1,200 per day shall be charged which shall be inclusive of all expenses such as but not limited to hotel, rental car, and meals. If the EMSCC must make an additional trip to the job, then a trip charge of \$600 plus EMSCC daily rate of \$1,200 shall apply to each additional visit. Home Depot Project Manager must approve additional days or trips in advance.
- F. EMSCC shall provide a copy of the EPC Punch List to the General Contractor before leaving the job site. Home Depot Project Manager, Energy Manager, Lead Technical Support Engineer, and any other Home Depot personnel or contractor as designated by Home Depot shall receive distribution of EPC Punch List within two (2) business days upon conclusion of commissioning visit. EMSCC shall post a copy of the EPC Punch list to Expesite. General Contractor shall be responsible to see that the applicable trade shall resolve any items identified on the punch list.
- G. Refer to FBO procedures above including Receipt of Novar Shipment Requirements.

**3.02 MECHANICAL EQUIPMENT COMMISSIONING**

- A. The Mechanical Contractor is responsible for the installation and start-up of all mechanical equipment per manufacturer's recommendations. Equipment start-up shall be completed by possession date. The EMSCC shall verify the installation and operation of all equipment and devices (Equipment Performance Check) controlled by the energy management system. Mechanical Contractor shall correct any deficiencies noted by EMSCC. All deficiencies shall be resolved by the EMSCC's second visit.
- B. Mechanical Contractor shall complete an RTU "Equipment Startup Checklist" for each RTU per the requirements of Section 15730. Mechanical Contractor shall make available to EMSCC the completed Checklists during the first commissioning visit
- C. Mechanical Contractor shall make available to EMSCC a qualified HVAC service technician during day three or four of the first commissioning visit. HVAC service technician shall make any necessary adjustments or repairs at the direction EMSCC. Mechanical Contractor HVAC service technician shall be required to have two sets of refrigerant gauges, one amp meter, and any necessary hand tools to complete the Equipment Performance Check (EPC).
- D. The Mechanical Contractor is responsible for the installation and start-up of all mechanical equipment per manufacturer's recommendations. Equipment start-up shall be completed by possession date. The EMSCC shall verify the installation and operation of all equipment and devices (Equipment Performance Check) controlled by the energy management system. Mechanical Contractor shall make available to EMSCC a qualified HVAC service technician to complete commissioning of the equipment. HVAC service technician shall make any necessary adjustments or repairs at the direction EMSCC. Mechanical Contractor HVAC service technician shall be required to have two sets of refrigerant gauges, one amp meter, and any necessary hand tools to complete the Equipment Performance Check (EPC).
- E. EMSCC shall complete the installation and termination of all CO<sub>2</sub>, temperature, and humidity sensors except in areas where local labor jurisdictions claim responsibility for the work. In this case the terminations shall be done by the EC and supervised by the EMSCC. EMSCC shall also be responsible for setting all dipswitch address settings and component adjustments.



**Construction Specification (FBO) ENERGY MANAGEMENT CONTROLS AND COMMISSIONING****3.03 ELECTRICAL EQUIPMENT COMMISSIONING**

- A. Electrical Contractor shall make available to EMSCC a qualified electrician with lift and any necessary tools and instruments to assist the EMSCC with the Equipment Performance Check for the full duration of the EMSCC's visits. Electrical Contractor shall correct any deficiencies noted by EMSCC. All deficiencies shall be resolved by the EMSCC's second visit.
- B. Electrical Contractor shall receive and install Novar HDP-21 panel and outside air mast assembly. Installation of Novar HDP-21 panel and outdoor mast assembly shall be completed no later than building possession date. Termination of all low voltage wiring to Novar HDP-21 panel shall be completed by EMSCC except in areas where local labor jurisdictions claim responsibility for the work. In this case the terminations shall be done by the EC and supervised by the EMSCC.
- C. Electrical Contractor shall be responsible to coordinate the installation of the following devices with the applicable trade prior to building possession date.
  - 1. Coordinate the installation of dedicated CAT-5 data line to energy management panel with premise network system contractor.
  - 2. Coordinate the installation of the security occupancy switch inside the computer room with the premise security contractor.
- D. Electrical Contractor shall leave a service loop of no less than seventy-two (72) inches at each RTU controller terminal board TB1, and twenty-four (24) inches unit heater controller, and sensor as detailed on the construction drawings.
- E. Termination of low voltage wiring to RTU controllers at TB1, unit heater, and make up air controllers (MIN I/O's), and sensors shall be completed by EMSCC except in areas where local labor jurisdictions claim responsibility for the work. In this case the terminations shall be done by the EC and supervised by the EMSCC.
- F. Electrical Contractor shall provide all conduit, boxes, couplings, connectors, pull lines, and necessary line voltage (as applicable) per Division 15 and 16 specifications and contract documents. EC shall provide and pull into place all low voltage cable, control circuits, and wiring (as applicable) to install energy management system as defined in the specifications and contract documents.
- G. No splices shall be allowed in Class I or II wiring except at EMS control centers or end devices. Outside air mast sensor wiring shall only be spliced at junction box per the construction drawing.
- H. Class I control circuit conductors shall be 12 AWG minimum or greater sized for a maximum voltage drop of 10% of the circuit voltage. Class II control circuit conductors shall be 18 AWG minimum, Belden 8760 or equivalent.
- I. All wires to each device shall be laced or tied at point of entry into control panel and tagged as to its point of origin per drawings.
- J. Control or interlock wiring shall not be run in conduit with any power wiring other than that serving the equipment controlled
- K. Refer to Division 16, ELECTRICAL, for extent of work under that Division. Provide other wiring systems required to accomplish the work of this Section, following requirements of Division 16 for products and execution

**3.04 ATTACHMENTS**

- A. The following attachments are part of this section.
  - 1. "General Contractor Energy Management Commissioning Pre-Visit Check-Off Sheet"

END OF SECTION

**General Contractor  
Energy Management Commissioning  
Pre-Visit Check-Off Sheet**

**General**

**YES NO**

- ☐ Date \_\_\_\_\_
- ☐ Store Number and Location \_\_\_\_\_
- ☐ General Contractor Contact and phone \_\_\_\_\_
- ☐ Notify EMS Controls Contractor (Entek) immediately in the event of Turn Over or Grand Opening change
- ☐ ☐ Electric and Gas utilities are complete

**Electrical Related Items**

**YES NO**

- ☐ ☐ Novar Communication line complete to roof top equipment, front electric panel, and unit heaters
- ☐ ☐ 120V wiring complete to Novar panel per construction drawings
- ☐ ☐ Class 2 wiring to Novar panel complete per construction drawings
- ☐ ☐ Data Line to Novar EMS panel complete
- ☐ ☐ Energy Management occupancy switch interface to security system complete
- ☐ ☐ Novar outside air mast installed and wired
- ☐ ☐ Generator installed and tested by generator vendor
- ☐ ☐ Generator run status and fault alarm wiring to Novar panel complete
- ☐ ☐ Junction boxes and conduit installed for EMS sensors

**Mechanical Related Items**

**YES NO**

- ☐ Arrangements made for Mechanical Contractor HVAC technician to be on site during day 3 or 4 of turnover
- ☐ ☐ RTU's fully installed per prints, specifications, and manufactures instructions.
- ☐ ☐ Condensate drain lines for RTU's installed per drawings
- ☐ ☐ RTU field installed accessories such as economizers and CO2 interface relays installed
- ☐ ☐ RTU Startup completed per manufacturer's recommendations.
- ☐ ☐ RTU Equipment Startup Checklist completed for each RTU and faxed to EMSCC
- ☐ ☐ Evaporative coolers installed and tested
- ☐ ☐ Unit heaters installed and tested
- ☐ ☐ Radiant heaters installed and tested
- ☐ ☐ Exhaust fans and controls installed and tested

**General Contractor Comments**

**PART 1 - GENERAL****1.01 SUMMARY**

- A. Provide for testing, adjusting and balancing of the heating, ventilating and air conditioning equipment and systems.
- B. Related Work specified elsewhere includes but not limited to:
  - 1. Section 15010 - Mechanical General Requirements
  - 2. Section 15610 - Unit Heaters
  - 3. Section 15730 - Roof Top Units
  - 4. Section 15880 - Air Distribution

**1.02 QUALITY ASSURANCE**

- A. Test and balance shall be in accordance with the Associated Air Balance Council and report forms shall be AABC format or may be in accordance with NEBB recommendations and format.
- B. Testing and balancing procedures, instrumentation and recording shall be in accordance with the current recommendations and standards of AABC or NEBB.
- C. Air balance and testing shall not begin until the system has been completed and is in full working order or, at the direction of the Architect of Record, any part thereof shall be placed into operation for the purpose of testing and balancing.
- D. The Contractor shall put all heating, ventilating and air conditioning systems and equipment into full operation and shall continue the operation of same during each working day of testing and balancing.
- E. Test and balancing shall be provided by a third party contractor.
- F. Final air balancing shall only be required on ducted systems with fans, blowers and air handling equipment.

**1.03 SUBMITTALS TO ARCHITECT OF RECORD**

- A. Detailed reports covering all Testing and Balancing functions for each item of HVAC equipment shall conform to AABC or NEBB standards and shall be submitted to the Architect of Record for approval and record purposes.

**PART 2 - PRODUCTS (Not Applicable)****PART 3 - EXECUTION****3.01 SYSTEM PREPARATION**

- A. Air Side Systems:
  - 1. Prepare all air side systems for balancing as follows:
    - a. All fans, blowers and air handling equipment shall be mechanically checked and available to operate under design condition.
    - b. All volume dampers, fire dampers and vanes shall be in their neutral positions.
    - c. All grilles, diffusers, etc., shall be installed with vanes and blades in their neutral positions.
    - d. All controls shall be physically checked and available to operate under design conditions.
    - e. New filters shall be installed.
    - f. All damper locking devices shall be marked so that they truly represent the position of their respective dampers.
- B. Installation shall not be considered complete until final reports by agency have been submitted to the Architect of Record.

**3.02 ADJUSTING AND BALANCING**

- A. Test, adjust and balance all air systems to provide the air quantities and conditions as shown on the drawings within a 10% variance.
- B. Make changes to sheaves, belts, valves and dampers or provide additional dampers required to provide air quantities shown on the drawings.

**END OF SECTION**

**PART 1 – GENERAL****1.01 RELATED DOCUMENTS**

- A. The General and Supplementary Conditions and General Requirements (Division 1), apply to the work specified in this Section.

**1.02 SITE VISIT AND FAMILIARIZATION**

- A. Contractors proposing to undertake work under this Division shall:
  - 1. Visit the site of the work, and fully familiarize themselves of all conditions that affect the work or cost thereof.
  - 2. Examine the drawings and specifications as related to the site conditions.
  - 3. Acquaint themselves with all utility companies from whom services shall be supplied; verify locations of utility service points, demarcations and interfaces and determine exact requirements.
- B. Notice: Consideration will not be granted for any alleged misunderstanding of the amount of work to be performed. Tender of proposal shall convey full agreement and understanding to all items and conditions specified, indicated on the drawings, and required by nature of the site.

**1.03 DISCREPANCIES**

- A. Should the Electrical Contractor find discrepancies or omissions in the Contract Documents, or be in doubt as to the intent, he shall immediately obtain clarification from the Electrical Engineer before submitting a proposal for work under this Division.
- B. It is the electrical contractor's responsibility to review the drawings and specifications prior to submitting their bid, for compliance with the local regulations of the Electrical Inspection Agency, Fire Inspection Agency and the Local Electric and Telephone Utilities, and to notify the engineer of record immediately of any discrepancies found.
- C. Electrical Material and Labor costs shall be estimated on a project specific basis without the use of "flat rate" estimating guides from sources such as NECA (National Electrical Contractors Association), or similar. Electrical contractor is directed to acquaint himself with article titled "Changes in the Work", in the agreement between Owner and Contractor, unit prices requested in Bid Proposal Form and Statement 12, "Change Orders", in Bid Proposal Form.

**1.04 WORK IN OTHER DIVISIONS**

- A. See Architectural, Structural and Mechanical Divisions of the Specification for related work.

**1.05 CODES, PERMITS AND FEES**

- A. This electrical installation shall comply with:
  - 1. All laws applicable to the electrical installation, which are enforced by local authorities.
  - 2. The latest edition of the National Electrical Code.
  - 3. The regulations of the Electric Utility Company.
- B. The Contractor shall obtain and shall pay for all applications and permits required by the local authorities; and utilities (including those for temporary and permanent electric service, standard and special metering and telephone service connections).
- C. After completion of the work, the Electrical Contractor shall furnish to the Electric Utility Company, for the Owner, a certificate of final review and approval from the inspection bureau having jurisdiction.
- D. Where, in any specific case, different sections of any of the aforementioned codes and regulations or these plans and specifications each specify different materials, methods of construction, or other requirements, the most restrictive shall govern. In the case of any conflict between a general provision and a special provision, the special provision shall govern.
- E. Electrical Contractors proposing to undertake work under this division shall review the drawings and specifications subsequent to the approval for permit by the local authorities, noting any and all comments, changes or additions to the work herein described, and immediately notify the Electrical Engineer for proper coordination with his work and that of other divisions. The same shall apply for any similar circumstances arising during construction, prior to the completion of work.

**1.06 AS-BUILT (RECORD) DRAWINGS**

- A. Record on one set of electrical drawings all changes and deviations from the contract drawings. Record final location of switchboards, panelboards, transformers, disconnect switches, etc. Make sufficient measurements to locate all major underground conduit runs and show same on record drawings and deliver it to the Owner.
- B. Transfer changes and deviations to reproducible "sepia" drawings and deliver it to the Owner.

END OF SECTION

**PART 1 – GENERAL****1.01 RELATED DOCUMENTS**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section.

**1.02 DEFINITIONS**

- A. "Provide" shall mean furnish, install and connect complete.
- B. "Wiring" shall mean electrical conductors for power or signal, installed in conduit, wireway, raceways, or steel duct with all required boxes, fittings, connectors and accessories completely installed.
- C. "Work" shall be understood to mean all the materials completely installed including labor.
- D. "Drawings and Specifications" shall be understood to mean the Contract Documents, including all Divisions, Sections and Addenda.
- E. "Review of Shop Drawings" - See Division 1.
- F. "Conduit" shall be understood to mean rigid steel, intermediate metal (IMC), electric metallic tubing (EMT), flexible conduit or plastic Schedule 40 PVC conduit.
- G. "Contractor" shall be understood to mean the Electrical Contractor of record.
- H. "Engineer" shall be understood to mean the Electrical Engineer of record.
- I. "Alternates" - See Division 1.

**END OF SECTION**

**PART 1 - GENERAL****1.01 RELATED DOCUMENTS**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section.

**1.02 WORK INCLUDED**

- A. The work consists of furnishing all labor, supplies, materials, sales tax, permits, review fees, costs of tests, shop drawings, as-built drawings, operation & maintenance manuals and performing all operations including installation, cutting and chasing, trenching and back-filling, compaction, coordination with other trades on the job, etc., for the installation of complete electrical systems as shown and hereinafter specified.
- B. No materials shall be ordered or installed prior to shop drawing review by the Electrical Engineer. This requirement does not apply to materials furnished by Home Depot to the Contractor.
- C. The electrical drawings are schematic, and are not intended to show the exact location of conduit, outlets, etc. The Contractor shall refer to the architectural, structural, mechanical drawings and specifications for dimensions and exact requirements and shall fit his work to conform to the details of building construction. The right is reserved to shift any switch, receptacle, junction box, lighting fixture or other device a maximum of ten feet (10') from its location as indicated on the plans without incurring additional expense.
- D. Should conflicts exist between the drawings and specifications, the specifications shall govern.
- E. The drawings and specifications shall both be considered as part of the contract. Any work or material shown in the one and omitted in the other, or which may fairly be implied by both or either, shall be performed or furnished.
- F. Provision for the installation of all control system and interlock wiring between systems, shall be provided under this division unless indicated otherwise under Division 15 of the Specifications.
- G. Labor required to perform warranty work during the warranty period shall be included in this contract, whether the materials are furnished by the electrical contractor or by Home Depot.
- H. The electrical contractor shall be responsible for off-loading, inspection, storage and protection of all materials whether furnished by the electrical contractor or furnished by Home Depot.
- I. The electrical contractor shall be responsible for providing all claims and return shipments of materials damaged during shipping whether furnished by the electrical contractor or furnished by Home Depot to the appropriate vendor.
- J. The electrical contractor shall be responsible for providing all return shipments of unused materials whether furnished by the electrical contractor or furnished by Home Depot to the appropriate vendor.
- K. Credits for damaged or unused materials shall be turned in to the Home Depot project manager.

**1.03 DEVIATIONS**

- A. No deviations from the drawings and specifications shall be made without written approval from the Owner, Project Manager, and Electrical Engineer. Should the Contractor find, at anytime during the progress of the work that, in his judgment, existing conditions make desirable a modification in requirements covering any particular item or items, the Contractor shall report such items promptly to the Project Manager for his decision and instructions.

**END OF SECTION**

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. The General and Supplementary Conditions and General Requirements (Division 1), apply to the work specified in this Section.

1.02 WORK NOT INCLUDED

- A. The installation and connection of the following items is not included in this section of the specifications:
1. All motors for mechanical equipment together with the associated motor controllers, starters, speed controls, electrical heating equipment, control contacts, relays, control transformers, individual element protection, and miscellaneous etc., shall be furnished and installed under Section 15 of the specifications.
  2. Premises telephone wiring system (except as noted on the drawings, refer to Section 16700).
  3. Premises public address system (except as noted the drawings).

END OF SECTION

**PART 1 - GENERAL****1.01 RELATED DOCUMENTS**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section.

**1.02 INSPECTION AND TESTS**

- A. The electrical installation shall be inspected and tested by this contractor to insure safety to building occupants, operating personnel, conformity to codes and contract documents.
- B. All tests shall be performed using recognized safety procedures during energizing and de-energizing of all equipment to ensure personnel safety and equipment protection.

**PART 2 - PRODUCTS****2.01 MATERIALS**

- A. Provide all instruments, labor and material required for any essential, intermediate and/or final tests described hereinafter or necessary to prove compliance with these specifications.

**PART 3 - EXECUTION****3.01 INSTALLATION**

- A. Tests: Field tests shall be performed and reports submitted. Approval tests shall include, but not be limited to, the following:
  - 1. All feeders rated below 600 volts shall be megger tested between phase conductors and between phase conductors and ground. Tests shall be made upon completion of all connections, splices and installation of all overcurrent protection devices. Tests shall indicate freedom from short circuits, grounded circuits, reverse polarity, proper phase rotation, etc.
  - 2. All parallel circuits shall be tested for proper phasing or other comparable techniques.
  - 3. The full load running current of all motors shall be recorded and overload heaters selected in accordance with the test results.
  - 4. Full load currents of each feeder shall be measured and circuit rearrangement provided as necessary to achieve a balanced load on each phase.
  - 5. Operation of all control and alarm circuits.
  - 6. AC system ground resistance (refer to Section 16450).

END OF SECTION



**PART 1 - GENERAL****1.01 RELATED DOCUMENTS**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section.
- B. Related Work specified elsewhere includes but not limited to:
  - 1. Section 16130 - Outlet Boxes and Junction Boxes
  - 2. Section 16140 - Switches and Receptacles
  - 3. Section 16400 - Service and Distribution

**1.02 IDENTIFICATION**

- A. Identify each device (i.e. receptacles, switches, communication outlets, security and fire alarm junction boxes, etc.), junction box, etc. with a label indicating load served, feeder designation, circuit designation, cable (voice, data, POS, system, etc...) designation, or equipment name, as appropriate.

**PART 2 - PRODUCTS****2.01 MATERIALS**

- A. Each panelboard shall be provided with a directory frame on inside of cabinet door. A neat and carefully type written directory card, identifying each branch circuit served shall be placed in the frame, under clear plastic cover. Spares shall be noted in pencil.
- B. Provide a 10" x 20" professionally pre-manufactured painted steel plaque on the exterior side of all electrical room doors indicating "DANGER-HIGH VOLTAGE".
- C. Provide a 1-1/4" x 1/2" gray finish, heat resistant adhesive label with 1/4" high-engraved letters for receptacles, switches, communication outlets, systems boxes, junction boxes, etc. in the office package or finished areas.

**PART 3 - INSTALLATION**

- A. Labels for surface, flush or recessed mounted equipment shall be installed on the exterior of equipment.
- B. Labels for devices (i.e. receptacles, switches, junction boxes, etc.) in the office package or finished areas shall be installed on the bottom of the face of the coverplate.
- C. In unfinished areas label all receptacles, toggle switches, communication outlets, systems boxes, junction boxes, etc. with a permanent marker neatly handwritten.

**END OF SECTION**

**Construction Specification****BASIC MATERIALS AND METHODS****PART 1 - GENERAL****1.01 RELATED DOCUMENTS**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section.

**PART 2 - PRODUCTS****2.01 MATERIALS AND WORKMANSHIP**

- A. All materials and equipment shall be:
  - 1. New and of best grade of standard manufacture.
  - 2. Approved by UL and be so labeled for its specific application.
  - 3. All wire and cable, shall be manufacturer marked as required by Article 310-11 of the NEC.
  - 4. Installed by skilled and licensed electricians and helpers working under the direct supervision of competent experienced foremen and superintendents.
  - 5. Installed in a thorough workmanlike manner, presenting a neat, clean appearance when completed. The electrical contractor shall replace any part or parts not meeting this requirement without extra expense to the Owner.
  - 6. All electrical equipment supplied shall be backed with a minimum of one year warranty from manufacturer. Warranty shall start from the Grand Opening date.
  - 7. All work performed shall be backed with a minimum warranty of one year from the installing contractor.

**2.02 TIMELY PLACING OF MATERIALS AND EQUIPMENT**

- A. Switchboards, panelboards, transformers, raceways, conduit, pull boxes, junction boxes, etc., shall be installed at the proper time during progress of construction. Coordinate work sequence and interface with other trades.

**2.03 SPACE REQUIREMENTS**

- A. Contractor for work under this Division shall be fully responsible for determining in advance of purchase that equipment and materials proposed for installation shall fit into the confines indicated and allow sufficient clearance for maintenance and service of all equipment including that of other trades.

**2.04 MANUFACTURER'S LITERATURE**

- A. Deliver all printed tags, instructions, certified drawings, parts lists, certificates, etc., supplied with equipment items, to the Project Manager at completion of project.
- B. Assemble all such printed materials into a stiff back binder identified on face.

**2.05 PROTECTION OF APPARATUS**

- A. All conduit and other openings shall be kept protected to prevent entry of foreign matter. Fixtures, equipment and apparatus shall be covered for protection against dirt, water, paint, chemical, or mechanical damage before and during construction. The original finish, including shop coat of paint of fixtures, apparatus, or equipment that has been damaged shall be restored prior to final acceptance.

**2.06 SUBMITTALS TO CONTRACTOR**

- A. The Contractor shall furnish complete submittals for each of the following listed items of electrical equipment in accordance with Division 1. For convenience, the Contractor may submit shop drawings in groups. The groups are listed below:

**GROUP I**

- 1. Security System

**GROUP II**

- 1. Devices & Coverplates
- 2. Conduit, Boxes & Fittings
- 3. Wire
- 4. Nameplate Samples & Schedule
- 5. Padlocks
- 6. Grounding Devices
- 7. Gutter Freeze Protection
- 8. Distribution equipment

**2.07 PAINTING**

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**Construction Specification****BASIC MATERIALS AND METHODS**

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- A. Switchgear and light fixtures shall be factory finish painted. Prime coat for other equipment shall be provided under this Division; finish painting under Division 9, "PAINTING".

**2.08 DRAYAGE, HOISTING AND SCAFFOLDING**

- A. Contractor for this Division shall:
  - 1. Be fully responsible for drayage, hoisting, warehousing and demurrage, for all equipment and materials to be furnished and installed under this Division.
  - 2. Provide all scaffolding required for erection of materials and equipment included under this Division.
  - 3. Be fully responsible for the safety of his employees using such scaffolding.
- B. Electrical Contractor shall review all shipments/deliveries of electrical equipment for compliance with approved plans and shop drawings. Any shipments/deliveries accepted by the Electrical Contractor shall be the sole responsibility of the Electrical Contractor for compliance.

**2.09 CUTTING AND PATCHING**

- A. Contractor for this Division shall provide openings required for work under this DIVISION.
  - 1. Contractor for this Division shall layout, to dimension and location, all openings on surfaces to be formed, framed, or cut.
  - 2. Should Contractor for this Division fail to adhere with Paragraph A-1, as work progresses, any openings required shall be cut and patched by General Contractor at the expense of the Contractor for this Division.

**2.10 INTERFACES WITH OTHER WORK**

- A. There are many interfaces between the work involved with this Division and the work in other Divisions particularly with Division 15. This Contractor shall be aware of the requirements of these other Divisions and his responsibilities at the interfaces.

**2.11 ALTERNATE MATERIALS**

- A. Contractor for this Division shall submit his bid based on materials scheduled on the plans and specifications. After the contract has been awarded, written requests to the Engineer for material substitutions may be submitted on the Contractor's Letterhead and accompanied with a complete Substitution Request Form (found at the end of this Section). Intent of request for substitution shall be detailed in the Contractor's letter.
- B. Failure of the Contractor for this division to attach a completed substitution request form for each alternate material submitted, does not relieve this contractor of his obligation to execute this contract in accordance with the drawings and specifications, regardless of any submittals indicated as reviewed and approved by the engineer, and returned to the contractor.
- C. Contractor shall provide independent pricing for materials and labor indicated as "alternates" on the plans.

**2.12 REJECTION OF MATERIALS**

- A. The Project Manager shall have the authority to reject any material, equipment, or workmanship not complying with these specifications, and the Contractor shall replace defective work or material immediately upon notification of rejection. Any material so rejected shall be removed from the job within twenty-four (24) hours of such rejection; otherwise, the Owner may have same removed at this Contractor's expense.

**2.13 EQUIPMENT SUPPORT**

- A. Where conduits, wireways, lighting fixtures, transformers, boxes or other electrical equipment are indicated as suspended, the electrical contractor shall provide steel support channel, rods, clamps or other associated devices to securely attach the suspended equipment to substantial structural steel or other similar elements of the building. Penetration thru the roof or walls for this purpose shall not be acceptable. All support systems shall be properly rated as complete assemblies for the weight load and purpose for which they are designed.

END OF SECTION

**PART 1 - GENERAL**

PROJECT NAME: HOME DEPOT

STORE NUMBER: \_\_\_\_\_

OWNER'S CONSTRUCTION MANAGER: \_\_\_\_\_

ARCHITECT OF RECORD'S PROJECT MANAGER: \_\_\_\_\_

OWNER: HOME DEPOT U.S.A., INC.

ENGINEER OF RECORD: \_\_\_\_\_

**Proposed Substitution:**

- \* Attach complete technical data, including laboratory tests, if applicable.
- \* Include complete information on changes to Drawings and Specifications that proposed substitution would require for its proper installation.
- \* Submit the cost credit associated with this substitution.
- \* Submit a sample of normally manufactured items.

**Answer The Following:**

- A. Does the substitution affect dimensions shown on Drawings?
- B. Does the undersigned agree to pay costs of changes to the building design, including engineering and detailing costs caused by the substitution in accordance with Section 01630, Substitutions and Product Options.
- C. What affect does the substitution have on other trades?
- D. Differences between proposed substitution and specified item?
- E. Manufacturer's guarantees of the proposed and specified items are:  

Same	Different
	(explain on attachment)

The undersigned states that the function, appearance and quality are equivalent or superior to the specified item.

SUBMITTED BY: \_\_\_\_\_

SIGNATURE: \_\_\_\_\_

DATE: \_\_\_\_\_

TELEPHONE: \_\_\_\_\_

**END OF SECTION**

**PART 1 - GENERAL****1.01 RELATED DOCUMENTS**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section.
- B. Related work specified elsewhere includes but is not limited to:
  - 1. Section 01012 - Preferred Purchasing

**1.02 PREFERRED PURCHASING**

- A. Unless noted otherwise, Contractor and all subcontractors are encouraged to purchase all products listed in this specification section from a local The Home Depot Store. For more information, refer to Section 01012.

**PART 2 - PRODUCTS****2.01 SECONDARY SERVICE CONDUIT**

- A. Secondary electrical service duct banks shall be concrete encased galvanized rigid steel conduit, IMC, or Schedule 40 PVC.

**2.02 FEEDERS**

- A. Rigid conduit or IMC shall be used for all feeders and sub-feeders where exposed to possible physical damage. EMT shall be permitted for feeders in protected areas.

**2.03 RACEWAYS**

- A. Except as otherwise noted, specified, or required, provide all conductors in rigid conduit, EMT, flexible conduit or Schedule 40 PVC as hereinafter specified. Rigid conduit, or EMT shall be of the best quality hot-dipped galvanized or sherardized steel tubing, and of standard trade dimensions, smooth inside and out. Each length of conduit shall bear the maker's trademark or stamp.
- B. Connections to panelboard cabinets and pull boxes shall have grounding wedge lugs, Thomas & Betts, or approved equal, between the busing and the box, or locknuts so designed to bite into the metal.
- C. Rigid conduit fittings shall be of steel or malleable iron, as manufactured by Thomas & Betts or approved equal. ZINC DIE CAST FITTINGS ARE NOT PERMITTED.
- D. Fittings for electrical metallic tubing shall be steel set screw type with nylon insulated throat, case hardened locknut, and zinc chromate finish. ZINC DIE CAST FITTINGS ARE NOT PERMITTED. Fittings as manufactured by Midwest, Raco, or Appleton are acceptable.
- E. All PVC rigid conduit, fittings and cement shall be produced by the same manufacturer. All joints shall be solvent welded in accordance with manufacturer's recommendations. All PVC conduit shall be Schedule 40.
- F. Strain relief cord grip connectors shall be oil and water resistant, with a neoprene bushing, Thomas & Betts Series 2631, or approved equal.
- G. To insure continuity of ground and improved conductivity, use Kopr-Shield compound, Series CP-8 as manufactured by Thomas & Betts, or approved equal, on all threaded joints.
- H. Provide junction boxes and pull boxes where shown on plans, in accordance with Article 370 of the NEC, and as necessary to avoid excessive runs or too many bends between outlets.
- I. Expansion fittings shall be installed in all rigid conduit and EMT, which passes through an expansion joint. Approved manufacturers are Appleton, Crouse-Hinds, or O.Z. Gedney Manufacturing Type "AX".
- J. Approved conduit manufacturers are:
  - 1. RIGID, IMC OR FLEXIBLE CONDUIT
    - a. Allied
    - b. Wheatland
  - 2. FLEXIBLE CONDUIT (PVC Cover)
    - a. Anaconda "Sealite"
    - b. Robroy
  - 3. ELECTRICAL METALLIC TUBING
    - a. Allied

- b. Wheatland
- 4. PLASTIC PVC
  - a. Carlon Schedule 40
  - b. J-M Manufacturing

**2.04 FLEXIBLE CONDUIT**

- A. FLEXIBLE STEEL CONDUIT (NO COVER): Flexible steel conduit shall be used in making short flexible connections from outlet boxes to recessed lighting fixtures. Flexible steel conduit serving lighting fixtures shall be 72" in length. Flexible steel conduit serving other equipment shall be as short as possible, but shall have a minimum length of 12".
- B. PVC EXTRUDED COVER FLEXIBLE CONDUIT: Only PVC extruded cover flexible conduit will be permitted for use in making up short flexible connections to dry-type transformers, rotating or vibrating machinery, display equipment, or any other equipment where exposed to moisture. The flexible conduit at these locations shall be as short as possible, but no less than 12".
- C. A copper stranded bonding jumper shall be installed inside all flexible conduits. Provide an insulated grounding coupling at the transition from rigid to flexible conduits.

**2.05 INSULATING BUSHINGS**

- A. All rigid conduit 1" and larger terminating in cabinets, panel boxes, pull boxes, and similar boxes shall have insulated grounding bushings.

**2.06 CONDUIT PROTECTION**

- A. Conduits for electrical service entrance conductors, installed in the ground, both outside and beneath the building, shall be encased in a concrete duct bank. Conduits shall be spaced a minimum of 8.25" on center with a minimum of 4" of concrete on all sides. The depth to the top of electrical duct bank encasement shall be 30". All threaded joints in conduit that are encased in concrete shall have UL listed joint compound applied in order to be concrete tight and watertight.
- B. Conduits for branch circuits outside the building not beneath driveways or parking areas shall be directly buried without concrete encasement. The depth to the top of direct buried conduits shall be 30".
- C. Conduits runs inside the building, that are indicated as run concealed, below the "on-grade" floor slab, shall be installed below the slab base, prior to the floor slab pours. Conduit runs shall be spaced no less than 2 times their diameter. Where vapor barriers are installed between the base and the floor slab, reseal conduit penetrations as required to maintain continuity of the vapor barrier.
- D. For all conduits and conduit duct banks installed in the ground outside the building, provide identifying marker tape the entire length of each conduit or duct bank. The tape shall be constructed of inert polyethylene, resistant to acids, alkalis, etc., in the soil, and shall be a minimum 4 mil thickness. The tape shall be yellow, 6" wide, and shall have the words "CAUTION ELECTRIC LINE BURIED BELOW," imprinted with contrasting permanent ink. The imprint shall repeat itself for the entire length of the tape. The tape shall be buried at a maximum of 18" below finished grade, above a portion of the earth fill above the conduit or concrete encasement. The tape shall be "Terra Tape" as manufactured by Reef Industries Inc., P. O. Box 33248, Houston, Texas 77033 (1-800-231-6074).
- E. Conduit shall be secured in place and protected to prevent damage to work during construction. The ends of all conduit and conduit fittings shall be plugged to avoid filling with debris. Install Thomas & Betts "Push-Penney Plugs," Series 1470 on all conduits prior to final connection. All conduit shall be cleared of water and debris prior to pulling wire.
- F. Conduits shall not be installed on the interior columns of the sales area and receiving area.
- G. Conduits serving the roof top equipment, including HVAC feeders, service receptacles, EMS and Fire Alarm controls, shall be routed along the overhead structure and turned down the perimeter and interior walls at the panel or cabinet of the circuits' origination.
- H. Conduits shall be surface mounted on all tilt-up walls, unless specifically noted as concealed.

**2.07 CONCRETE**

- A. Concrete for underground conduit protection, pads and conduit duct banks shall be of 3000 PSI mix.

**2.08 CUTTING AND PATCHING**

- A. Provide sleeves for conduit, cables and busways accurately before concrete floors are poured, or set boxes on the forms so as to leave openings in the floors in which the required sleeves can be subsequently located; in which case fill in the concrete voids around the sleeves.

- B. Should the contractor neglect to perform this preliminary work and should cutting be required in order to install conduit, cables, busway, or equipment, the expense of the cutting and restoring of surfaces to their original condition shall be borne by this Contractor.

## **2.09 PENETRATIONS**

- A. Where any electrical item such as conduit, cable, telephone cable, busway, etc., penetrates a wall, floor, or ceiling, the original integrity of the respective wall, floor, or ceiling shall be restored. The fireproof rating of the sealant used shall have an equal or better rating than the original fire separation material.
- B. Seals shall be provided for all telephone cable. Coordinate this installation with the local telephone company.
- C. All openings provided for future conduit or future cable shall be fire sealed.
- D. The penetrations shall be fire sealed with the original material or a UL listed fitting designed for that purpose.

## **2.10 BELOW GRADE CONDUIT AND CABLE SEAL**

- A. The seal for either conduits or cables below grade shall form a reliable, lasting seal between building exterior and shall be able to withstand pressures to a minimum of 50 feet head of water. The below grade seals shall be as manufactured by O.Z. Gedney and sized for the particular application.

## **2.11 THREADED JOINT COMPOUND**

- A. Threaded joint compound shall be corrosion inhibiting compound that is electrically conductive under pipe joint pressure. The compound shall be Thomas & Betts "KOPR-SHIELD", or approved equal.

## **2.12 SMOKE AND FIRE STOP FITTINGS**

- A. Smoke and Fire Stop Fittings shall be UL listed for that purpose. The fittings used to seal conduit either on the outside of the conduit or cable or internally shall have heat activated intumescent material which expands to fill all voids and shall be O.Z. Gedney "FIRE-SEAL" or approved equal with an hourly fire-rating equal to or higher than the rating of the floor or wall through which the cable or conduit passes. The seals for conduit shall be of the flanged type.

## **2.13 CORROSION PROTECTION**

- A. Conduits installed in concrete or in direct contact with the earth, or in areas subject to acidic soils, high ground water, or other severely corrosive influences, shall be protected with anti-corrosive compounds, which are UL approved for that particular application.

# **PART 3 - EXECUTION**

## **3.01 INSTALLATION**

- A. Conduit shall be continuous from outlet to outlet, from outlet to panelboard cabinet, junction box, and/or pull box. Conduit shall enter and be secured to all boxes, etc., in such a manner that each system will be electrically continuous from service to all outlets. All conduit from panelboard cabinets and junction boxes shall terminate in approved outlet boxes or conduit fittings. Conduit connection to any box, which has no threaded hub for its reception, shall be double locknotted.
- B. In general, the conduit installation shall follow the layout shown. However, this layout is diagrammatic only; where changes are necessary due to structural conditions, other apparatus, or other causes, such changes shall be made without any additional cost to the Owner. Offsets in conduit are not indicated, and must be provided as required.
- C. At couplings, conduit ends shall be threaded so they meet in the coupling. Right and left couplings shall not be used; conduit couplings of the Erickson type, or approved equal, shall be used at locations requiring such joints.
- D. Where conduit is installed in outdoor or indoor locations and exposed to continuous or intermittent moisture, connections at enclosures shall provide a liquid-tight seal. The sealing hub fittings shall be of steel or malleable iron, with a recessed sealing "O" ring and a nylon insulated throat, Thomas & Betts Series 370. All conduit and cable, telephone or otherwise, which extend from the interior to the exterior below grade shall be sealed with a fitting designed for that particular use so as to be watertight.
- E. Minimum size conduit for branch circuits shall be ½". Home run conduits for lighting branch circuits and receptacle branch circuits shall be ¾" minimum size. Home runs shall extend from outlets shown to panel designated.
- F. No bends will be permitted with a radius less than six (6) times the diameter of the conduit, and not more than 90 degrees.
- G. All conduits shall be concealed in walls, in/or below floors, or above ceilings unless otherwise directed or indicated. Concealed conduit shall be supported from the building construction at intervals not exceeding 8'-0". Concealed conduit

above the ceiling shall be supported independent of ceiling construction. Where ceilings of the lay-in type are used, conduit must be installed high enough to permit removal of ceiling panels and lighting fixtures.

- H. Where conduit is expressly shown to be run exposed, the conduit shall be supported at intervals of 8'-0" with machine screws for metal construction, and expansion bolts for masonry construction. Exposed conduit in finished spaces that pass through walls or ceiling shall be provided with galvanized steel escutcheons. Exposed conduit, where permitted by this specification, parallel or at right angles to the building walls and ceiling, shall be supported from walls or ceilings with approved galvanized iron clamps or hangers. Devices attached to masonry or slabs shall be secured with inserts and bolts or lead expansion sleeves. Provide a conduit support 8" or less from each outlet box, at each conduit elbow, and at each junction box.
- I. The conduit sizes shown may be increased if desired to facilitate the pulling of cables.
- J. Where devices are supplied from conduit in or below floor slabs, the conduit shall be stubbed up the specified height at the location shown and the masonry wall built-up around the conduit by cutting the webs of the concrete blocks.
- K. Where two (2) or more conduits are run parallel and adjacent, they shall be installed on gang hangers.
- L. Conduit embedded in concrete, which is in contact with the earth, and conduit installed outside the building below grade shall be rigid steel conduit, or Schedule 40 PVC. Conduit elsewhere shall be EMT unless specified or noted otherwise. Schedule 40 PVC conduits shall have rigid steel elbows at all bends. PVC conduit above grade (inside or outside the building) is not acceptable.
- M. Conduit run above grade, outside the building, not under solid canopy or structure shall be rigid steel.
- N. Conduits emerging from PVC runs below slab or grade to a panel, switchboard, or other device shall be rigid steel.
- O. Metallic conduits shall not be used as a means of equipment grounding or as an equipment grounding conductor where expressly forbidden by the local inspections department or plan review board of jurisdiction.
- P. Where conduit drops from the ceiling support structure to the merchandise rack system exceed 8' in length, the electrical contractor shall make provision for intermediate conduit support to satisfy the requirements of NEC 348-12 for EMT, and all other related articles including those for Rigid Steel Conduit.
- Q. All conduits shall be run at right angles with and/or parallel with floors and walls.
- R. All fire pump power and control wiring shall be in rigid metal conduit, intermediate metal conduit, liquidtight flexible metal conduit, or type mi cable.
- S. The Electrical Contractor shall coordinate the exact location of PVC drops poles with Home depot prior to final installation.
- T. Electrical Contractor shall cut opening in the top of the desk for cable and conduit exiting the PVC drop. Coordinate the exact location with Home Depot.

END OF SECTION



**PART 1 - GENERAL****1.01 SUMMARY**

- A. This specification covers the electrical characteristics and general requirements for installation of the track busway. The system shall be designed primarily for overhead distribution of electrical power to "in-rack", "endcap", "seasonal display", and "lighting truss" areas. Once installed, the track busway will provide a safe, flexible, and economic means of distributing electrical power to these areas.
- B. Related Work specified elsewhere includes but not limited to:
  - 1. Section 01010 - Furnished By Owner Items (FBO)
  - 2. Section 16100 - Basic Materials and Methods
  - 3. Section 16120 - Wire and Cables

**1.02 STANDARDS AND CERTIFICATION**

- A. The track busway system shall be designed and manufactured to the following standards:
  - 1. Underwriters Laboratories Standard, UL 857 – The common UL listing for Busways that is derived from the twelfth edition of UL 857, and the second edition of NMJ-J-148-1998-ANCE.
  - 2. CUL Listing
  - 3. National Electric Code (NEC) – Article 368 – Busways
  - 4. IEC 60439 European Busbar Trunking Systems

**1.03 FBO PROCEDURES**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section. General requirements related to Furnished by Owner (FBO) Items are as defined in Section 01010. All FBO Forms listed below are included as part of Section 01010.
- B. Vendor Contact: Contractor shall send a completed "FBO Form A: Contractor Information Form" to the FBO vendor indicated below, twelve (12) weeks prior to the scheduled installation of the specified system:

For ordering, scheduling, and installation contact:

Blythe Stephens, National Accounts  
Universal Electric Corp.  
168 Georgetown Road  
Canonsburg, PA 15317  
Phone: (800) 245-6378 x2035  
Fax: (724) 916-2221  
bsteph@uecorp.com

For all other issues contact:

Larry Doyle, Regional Manager  
Universal Electric Corp.  
168 Georgetown Road  
Canonsburg, PA 15317  
Phone: (800)245-6378 x2017  
lpd@uecorp.com

- C. Take-Offs: FBO Vendor shall provide "take-offs" to the Contractor as specified in Section 01010. The Contractor shall then verify this "take-off" using an "FBO Form B: Take Off Confirmation Sheet".
- D. Receipt Of Shipment: Contractor shall verify shipment per the requirements of Section 01010 and complete the "FBO Form C: Confirmation of Shipment" and submit back to the FBO vendor.
- E. Request for Changes: Changes to materials and quantities after receipt of shipment shall be coordinated by the contractor with the FBO vendor per the requirements of Section 01010 using an "FBO Form D: Request For Additional/Replacement Materials".
- F. Return Merchandise Authorization Policy: The Home Depot will add to the contractors' scope of work the responsibility for coordinating (1) customer accommodation return request through the FBO Vendor. Requests shall be submitted using the "FBO Form E: Returned Materials" as specified in Section 01010.

**1.04 SUBMITTALS TO CONTRACTOR**

- A. Submittals shall be in accordance with specified procedures. Submit shop drawing and product data for record purposes prior to shipment.
- B. Indicate construction details, including dimensions, weights, clearances, major component layout, power details. Include breaker, fused plug-in and cable schedule (if applicable).
- C. Indicate special receiving and handling procedures.

**1.05 WARRANTY**

- A. Manufacturer shall guarantee the entire track busway system against defective material and workmanship for a period of one (1) year from date of shipment. Manufacturer's liability on this warranty shall be limited to the repair or replacement, of any product which is returned to the manufacturer within one year of the date of shipment and which is found by the company to be defective in material or workmanship. This warranty does not cover expenses for removal or reinstallation.

**PART 2 - PRODUCTS****2.01 SYSTEM DESCRIPTION**

- A. Product: B60 & B100C Starline Track Busway
  - 1. Manufactured by:  
Universal Electric Corp.
  - 2. Electrical Requirement
    - Voltage: 120/208V or 300V
    - Frequency: 60 Hz
    - Ampacity: 60 A or 100 A per phase
    - Neutral Ampacity: 60 A or 100 A
    - Conductors: Qty. 4 (Phase A,B,C and Neutral)
    - Grounding: Aluminum Housing
  - 3. Environmental
    - Indoor, Low Impedance System
    - Ambient Operating Temperature: 40°C / 104°F  
60°C / 140°F (0.8 Amp Rating Multiplier)

**2.02 COMPONENTS**

- A. Frame and Enclosure
  - 1. Extruded Aluminum housing designed to be light weight and act as a 100% ground. Housings to be 5, 10, or 20 ft standard length. The housing shall be properly extruded with mounting channel on top to receive rod mount hangers (RHB-3) for hanging from bar joist. The housing by design is to be open on the bottom to accept plug-in units and shall pass UL's "hypothetical finger" probe test.
  - 2. All conductors shall be made of copper and sized to handle 100% of it's rating continuously with ambient temperatures below 40°C / 104°F. The conductors shall be electrically isolated from the housing.
- B. Plug-in Units
  - 1. Plug-in units shall be polarized to avoid incorrect installation and shall be pre-wired at the factory in equal amounts of Phase "A", Phase "B", and Phase "C" for proper balance of electrical loads. Phases are denoted by a "Blue", "Black", or "Red" dot visible on circuit breaker plug in units and quad box receptacles.
  - 2. Plug-in units include 20' drop cord with cord grips and 20A quad box receptacle as specified in the drawings. (See drawing E 2.0 for placement of plug-in units)
  - 3. Plug-in units shall use circuit breakers for branch circuit protection.
  - 4. Plug-in units shall have locking tab or bolt-on tab to secure units to the track busway.

**PART 3 - EXECUTION****3.01 INSTALLATION**

- A. Sections: The track busway runs will consist of lengths as shown on drawings.

- B. Hanging: Using supplied RHB-3 'Rod Mount Hangers', track busway will be hung from the bar joist using 3/8" all thread rod. The installing contractor shall be responsible for the connections to the bar joist and the 3/8" all thread rod to the RHB-3. The supplied RHB-3 Rod Mount Hangers will connect the busway to the 3/8" all thread rod and into the mounting channel of the track busway. The maximum spacing is 10 ft on center for the hangers. The height of the busway shall be coordinated with the Architect or project manager.
- C. Connecting Sections: At a junction of the track busway sections, the installer will insert a Bus Connector (BC-4) into the end of housing. Position next housing onto this connector and join (2) sections together electrically. There is also a Housing Coupler (HC-2) to join the track busway sections mechanically.
- D. End Power Feed: EPF60-4 or EPF100C is supplied to connect power at one end of the track busway. A terminal block is mounted in the EPF60-4 or EPF100C to accept incoming wire. The installing contractor is responsible for all conduit, wire, and fittings beyond this point.
- E. End of runs: EC60 End Cap will be provided to install at the end opposite of the EPF60-4 and EPF100C-4 end power feed.

END OF SECTION

**PART 1 - GENERAL****1.01 SUMMARY**

- A. This section of the specifications includes the furnishing and installation of wiring and cabling.
- B. Provide a complete system of wiring with all feeders and branch circuits as shown on the drawings. The wiring system shall be complete from the service entrance to each and every outlet and apparatus shown on the drawings, which require electrical connections.
- C. Related Sections:
  - 1. Section 01012 - Preferred Purchasing
  - 2. Section 16100 - Basic Materials and Methods
  - 3. Section 16125 - Low-Voltage Wiring

**1.02 PREFERRED PURCHASING**

- A. Unless noted otherwise, Contractor and all subcontractors are encouraged to purchase all products listed in this specification section from a local The Home Depot Store. For more information, refer to Section 01012.

**PART 2 - PRODUCTS****2.01 CONDUCTORS**

- A. Specified gauge sizes refer to American Wire Gauge. All wire and cable shall be of soft drawn, annealed copper having a conductivity of not less than 98% of that of pure copper. Each wire shall be continuous without weld, splice, or joint throughout its length; uniform in cross section and free from flaws, scales, and other imperfections.
- B. All conductors shall have 600 volt insulation. Sizes specified are AWG through No. 4/0 and circular mils above No. 4/0. Conductors #10 and smaller shall be solid; No. 8 and larger, stranded.
- C. Conductors No. 4 and smaller shall be type "THHN/THWN" larger conductors shall be type "XHHW".
- D. All conductors shall be American Insulated Wire Corporation, Alcan Cable, Southwire Company or approved equal., which requires submittal to, and approval by, the Architect/Engineer of Record.

**2.02 BRANCH CIRCUIT CONDUCTORS**

- A. Minimum wire size for lighting and power circuits shall be #12 (unless noted otherwise on the plans). For all 20 A. branch circuits, wire sizes shall be not less than those specified below:

120 V. circuits - Run distance in feet	Wire size in AWG
up to 60	#12
61 to 95	#10
96 to 150	# 8
151 to 230	# 6

277 V. circuits - Run distance in feet	Wire size in AWG
up to 130	#12
131 to 220	#10
221 to 330	# 8
331 to 530	# 6

480 V./1 circuits - Run distance in feet	Wire size in AWG
up to 225	#12
226 to 375	#10
376 to 575	# 8
576 to 900	# 6

based on THWN/THHN 75 degree C copper conductors, 1 phase circuits, 90% power factor, maximum circuit load of 16A., (K) constant = 12. Refer to the plans for specific circuit requirement. If the length of the circuit run exceeds what is listed in the charts above, the load on the circuit shall be limited such that #6 AWG conductors may be used and the voltage drop for the total circuit not exceed 5%. In no case shall the voltage drop exceed 3% for branch circuits.

- B. Typical non-conditioned power, lighting, and motor branch circuit conductors shall be color-coded as follows:

208Y/120 VOLT SYSTEM	480Y/277VOLT SYSTEM
Phase A - Black	Phase A - Brown
Phase B - Red	Phase B - Orange
Phase C - Blue	Phase C - Yellow
Neutral - White	Neutral - Grey
Ground - Green	Ground - Green

Conditioned power (Panel "CR" and "R") branch circuit conductors shall be color coded as follows:

Phase A - Purple  
Phase B - Pink  
Neutral - White with Yellow stripe  
Ground - Green  
Isolated Ground - Green with Yellow stripe

- C. Feeder and service entrance conductors shall be color coded by the use of colored plastic tape applied within 6" of each conductor end. Conductors passing through pull boxes will be similarly marked.
- D. Provide a #16 AWG iron pull wire or plastic pull line (rated at 500 lbs. test) in all conduits for future use. The ends of such conduit shall be capped.
- E. Branch circuit wiring which supplies more than one fluorescent fixture through the wireway of other fixtures shall be rated for use at 150 degrees C.
- F. All conductors in conduit and wireways shall be derated according to NEC 310-16 Note-8. All conductors pulled into the sales area lighting and rack power conduits and wireways shall be type THHN rated 90 degree C. Minimum allowed conductor size in the lighting and rack power raceway is #10 AWG.

### 2.03 WIRE AND CABLE SPECIFICATIONS

- A. All line voltage control wiring to the EMP shall be terminated in quick connect type clips. Use AMP plasti-grip or equal standard grade.
- B. All control wiring to lighting contactors shall be terminated in quick connect type clips. Use AMP plasti-grip or equal standard grade.
- C. All control wiring noted shall be stranded, not solid.
- D. All conductors for use at line voltages shall meet the specifications of this section, and shall be enclosed in continuous EMT conduit.
- E. MC cable can be used within concealed spaces or as specifically called out on drawings, and shall only be installed where permitted by local jurisdiction. MC cable shall be installed as required by NEC article 330. Minimum cable size shall match minimum conductor size as specified in this specification section.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

- A. Wire shall not be drawn into a conduit until all work of a nature, which may cause injury, is complete. Ideal, Wire-Ease, or approved equal may be used as a lubricant. Where two (2) or more circuits run to a single outlet box, tag each circuit with linen tags as a guide to the fixture hanger in making fixture connections.
- B. All stranded conductors shall be furnished with copper connecting lugs drilled or reamed the full diameter of the bar conductors. Mains and feeders shall be run their entire length in continuous pieces without joints or splices.
- C. Conductors shall be continuous from outlet to outlet and from outlet to junction box or pull box. All splices and joints shall be carefully and securely made to be mechanically and electrically solid with pressure type connectors, "SCOTCHLOK" or approved equal. Tape shall be "Scotch" No. 33+ for indoor and No. 88 for outdoor or approved equal. Where connection is made to any terminal, copper terminal lugs shall be bolted or compression fitted to the conductors. Where multiple connections are made to the same terminal, individual lugs for each conductor shall be used.
- D. At each fixture outlet a loop or end of wire not less than 8" long shall be left for connection to fixtures.
- E. No conductors shall be pulled until the raceway system is complete.
- F. The number of cross hatches, where indicated, designates the number of conductors to be installed when the number exceeds a minimum of two (2). Where cross hatches are not indicated, the number of conductors shall be as determined by switching, homeruns, etc. This does not apply to conduit provided for telephone or other special systems.

- G. Branch circuits shall contain the necessary number of conductors to afford the switch control indicated.
- H. Conditioned power circuits shall be #10 AWG minimum, including neutrals.
- I. Where exposed low-voltage PVC jacketed cabling is not allowed by local authorities, the low-voltage contractor shall determine an alternate wiring system that is acceptable to the local authorities. The electrical contractor shall provide and install the alternate wiring system per the direction of the low-voltage contractor and the requirements of Section 16125.

END OF SECTION

**Construction Specification****(FBO) FLEXIBLE WIRING SYSTEM (LITHONIA)****PART 1 - GENERAL****1.01 SUMMARY**

- A. Intent of this section is to describe a manufactured, modular, integrated electrical branch wiring system for lighting as manufactured by Lithonia RELOC, a division of Lithonia Lighting.
- B. Components: Install all components required for a totally integrated and operating modular branch circuit wiring system. The system shall begin with the Circuit Distributor (CD) and extend to lighting fixtures, all as specified herein and as indicated on the drawings.
- C. Related Work specified elsewhere includes but not limited to:
  - 1. Section 01010 - Furnished By Owner Items (FBO)
  - 2. Section 16500 - (FBO) Lighting

**1.02 SYSTEM DESCRIPTION**

- A. The flexible wiring system for the sales area lighting and emergency lighting, together with required factory mounting hardware, and accessories, shall be furnished by The Home Depot and installed by the electrical contractor under this Section. Any additional non-factory related devices or accessories required to support the flexible wiring system on ceiling or from building structure shall be provided by the electrical contractor.
  - 1. This does not include any aspect of the Fan/Light Cloud Display system.
  - 2. This does not include the in-rack display lighting, building mounted wallpacks, exterior lighting, or building signage wiring systems.
- B. Electrical contractor shall include in his price all labor and equipment rental necessary to completely install the flexible wiring system as indicated on the plans, and shall perform all warranty work required during the warranty period.
- C. All support channel, conduit, wireways, wire, couplings, connectors, clamps, brackets or any other non-factory accessories required to install the flexible wiring system shall be provided by the electrical contractor.

**1.03 FBO PROCEDURES**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section. General requirements related to Furnished by Owner (FBO) Items are as defined in Section 01010. All FBO Forms listed below are included as part of Section 01010.
- B. Vendor Contact: Contractor shall send a completed "FBO Form A: Contractor Information Form" to the FBO vendor indicated below, twelve (12) weeks prior to the scheduled installation of the specified system:
 

Acuity Brands, Inc.  
1400 Lester Road  
Conyers, GA 30012  
Contact: Parker Slade  
email: TheHomeDepotTeam@AcuityBrands.com  
phone: (800) 545-6818
- C. Take-Offs: FBO Vendor shall provide "take-offs" to the Contractor as specified in Section 01010. The Contractor shall then verify this "take-off" using an "FBO Form B: Take Off Confirmation Sheet".
- D. Receipt Of Shipment: Contractor shall verify shipment per the requirements of Section 01010 and complete the "FBO Form C: Confirmation of Shipment" and submit back to the FBO vendor.
- E. Request for Changes: Changes to materials and quantities after receipt of shipment shall be coordinated by the contractor with the FBO vendor per the requirements of Section 01010 using an "FBO Form D: Request For Additional/Replacement Materials".
- F. Return Merchandise Authorization Policy: The Home Depot will add to the contractors' scope of work the responsibility for coordinating (1) customer accommodation return request through the FBO Vendor. Requests shall be submitted using the "FBO Form E: Returned Materials" as specified in Section 01010.
  - 1. Restocking charges will be assessed as follows:
    - a. All material shall be accepted on a freight allowed basis.
    - b. A restocking fee shall not be charged on surplus material returned with a total value of \$1500.00 or less.
    - c. Surplus material to be returned in excess of \$1500.00 may be subject to a 15% restocking charge.
    - d. Defective and damaged material shall not be subject to restocking charges.
  - 2. Lithonia Lighting may limit returns to no more than 5% of the original order value of the store package.

**Construction Specification****(FBO) FLEXIBLE WIRING SYSTEM (LITHONIA)****PART 2 - PRODUCTS****2.01 CONDUCTORS, FLEXIBLE CONDUIT AND CONNECTORS****A. MATERIALS:**

1. The system shall be supplied in accordance with article 604 of the NEC, and shall meet the standards of UL 183. All components shall be individually UL labeled.
2. All wires used in the system shall be No. 12 AWG - CU, THHN, 600V, 90 degree C insulated (except where noted otherwise). All wires shall comply with NEC color-coding requirements.
3. Equipment grounding conductors may be bare when enclosed in cable sets or splitters.
4. All connectors and cables shall be constructed from galvanized steel.
5. The system connectors and cables shall be totally integrated. All connectors shall be labeled to indicate the pin configuration at every male or female port. Neutral pins shall be specifically labeled for identification.
6. The system connectors shall have positive locking contacts.
7. The system connectors shall be keyed to guarantee that no interconnection can occur between different voltages and that no connection can occur between devices not intended to be connected. This keying system shall be permanent, made of indelible material and impossible to defeat.
8. For the sales area lighting, the system shall have the capability of 5 wires, i.e. (4) phase conductors and (1) - #12 AWG copper ground wire. A label shall be affixed to each component indicating that the component has been tested and approved by Underwriters Laboratories for use as a multi-circuit, bi-directional system. Note: Where 5-wire multi-circuit systems are not allowed by the local authorities, two independent flexible wiring systems shall be provided.
9. All components shall meet UL requirements for connecting and disconnecting under load and be so listed.
10. The emergency lighting circuiting shall be segregated from the normal power circuits to the sales area lighting. Provide an independent flexible wiring system to these fixtures in addition to the normal lighting circuits.

**B. CIRCUIT DISTRIBUTOR (CD):**

1. The circuit distributor shall have a female connector on one end and a ½" threaded conduit connector body on the other end.

**C. SELECTOR CABLE 3 PORT (SC3):**

1. The SC3 shall have a male connector on one end and three female ports on the other end; one port shall connect to the male end of the next SC3, which shall continue the circuit distribution and one of the remaining two ports shall connect to the RELOC Cord Set. Each fixture tap port shall be color coded black or white, depending upon circuitry of contract drawings.

**D. CABLE EXTENDER (CE):**

1. The cable extender shall have a male connector on one end and a female casting connector on the other end.

**E. RELOC Cord Set (RCS):**

1. The RELOC cord set shall include a 12' flexible metal conduit (cord) from an attached male connector to the sales area fixture.
2. Each RELOC cord set connector shall be "keyed" so that the cord can only be used for connection in the prescribed manner within the system.
3. Disconnection of one (1) fixture shall not interrupt electrical service to other fixtures downstream.

**F. DROP CABLE (DC):**

1. The drop cable shall provide a flexible connection from an attached male connector to the lighting fixture (such as an exit sign).

**2.02 GUARANTEE**

- A. The Wiring System shall be guaranteed to operate and perform as described.

**2.03 SPECIAL NOTE**

- A. The flexible wiring manufacturer shall furnish the services of a trained factory representative to assist and instruct the electrical contractor in the proper installation of the components and system.
- B. All connectors shall be protected during the painting of ceiling. Cover all connectors completely, including labels. If labels are painted over, contractor shall replace the component material completely. Relabeling is not acceptable.

**PART 3 - EXECUTION****3.01 SUPPORT**



- A. Flexible wiring shall be strapped to the structural roof support system, following the lines of the deck and framing either parallel or perpendicular.
- B. Flexible wiring shall not run diagonally across the ceiling.
- C. Flexible wiring shall be routed around all skylights.
- D. Supports shall be provided at intervals as specified by the manufacturer.
- E. Cable shall be tight against deck or insulation (where applicable) without sagging.
- F. The owner reserves the right to relocate any lighting fixture connected to the flexible wiring system ten (10) feet without incurring additional expense.
- G. Coils of slack cable shall be minimized to the greatest extent possible.
- H. Final adjustment of lighting fixtures shall be facilitated by using the spare cord provided in the RELOC cord set attached to the fixture. Use spare cable extenders to move the fixture when relocation is required beyond the length of the RELOC cord set.

### 3.02 SLACK CABLE

- A. Provide additional spare cable extenders (10' min.) to pass under and around solid structural beams and smoke curtains (where shown on the plans).

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

- A. This section of the specifications includes the furnishing and installation of low-voltage wiring including:
1. Data Cabling
  2. Paging Cabling
  3. Energy Management Cable and Termination Hardware
- B. Provide a complete system of low-voltage wiring and termination hardware as shown on the drawings. The low-voltage wiring system shall be complete from the service entrance to each and every apparatus shown on the drawings, which require connections.
- C. Scope Of Work
1. Energy Management System (EMS) Controls Wiring:
    - a. Electrical Contractor responsible for providing and installing: Conduit, Boxes, and Low Voltage Wiring.
    - b. Energy Management System Controls Contractor is responsible for all EMS Low Voltage Wiring final connections and terminations per the requirements of Section 15952.
  2. ITS Low-Voltage Wiring:
    - a. Electrical Contractor responsible for providing and installing: Conduit, Boxes and associated Hardware.
    - b. ITS Contractor is responsible for providing and installing: Cabling, IDF Cabinets and making all Low Voltage final connections and terminations per the requirements of Section 16710.
  3. HDTV Equipment Low-Voltage Wiring:
    - a. Electrical Contractor responsible for providing and installing: Conduit, Boxes and associated Hardware.
    - b. HDTV Contractor is responsible for providing and installing: Satellite, Cabling and making all Low Voltage final connections and terminations per the requirements of Section 16715.
  4. Fire Alarm System or Fire Protection Supervisory System Low-Voltage wiring shall be per the requirements of section 16720
  5. Security System Low-Voltage Wiring shall be per the requirements of Section 16727
- D. Related Sections:
1. Section 01012 - Preferred Purchasing
  2. Section 13727 - Security Alarm System
  3. Section 15952 - Controls
  4. Section 15960 - Energy Management Controls and Commissioning
  5. Section 16100 - Basic Materials and Methods
  6. Section 16120 - Wire and Cables
  7. Section 16710 - Information Transport System
  8. Section 16715 - Television Equipment
  9. Section 16720 - Fire Alarm System or Fire Protection Supervisory System (as applicable)

1.02 PREFERRED PURCHASING

- A. Unless noted otherwise, Contractor and all subcontractors are encouraged to purchase all products listed in this specification section from a local The Home Depot Store. For more information, refer to Section 01012.

PART 2 - PRODUCTS

2.01 LOW-VOLTAGE CABLING

A. Data Cabling

	<u>COLOR</u>	<u>CATEGORY/ RATING</u>	<u>AVAYA/VENDOR PART #</u>
Horizontal/Riser Cabling – UTP (non-plenum)	Light Blue	CAT5E	1061 004 CLB W1000
Horizontal/Riser Cabling - UTP (plenum)	Blue	CAT5E	2061 004 BBL W1000
Riser/Backbone Wiring–Fiber (non-plenum)	Slate Gray	Accumax®	LGBC-006D- LRX (UL-ONFR) riser rated-tight buffered, six strand multimode 62.5/125 micron
Fiber Innerduct (1 ¼" diameter, non-plenum rated)	Orange	N/A	Carlson DG4X1C
Riser/Backbone Wiring–Fiber (plenum)	Slate Gray	Accumax®	LGBC-006D- LPX (UL_OFNP) plenum rated-tight buffered, six strand multimode 62.5/125 micron
Fiber Innerduct (1 ¼" diameter, plenum rated)	White	N/A	Pyramid PLM 125T/5000

**B. Paging Cabling**

	<u>COLOR</u>	<u>PART#</u>	<u>VENDOR PART #</u>
Paging System	Gray	N/A	West Penn 224

- C. All low voltage conductors from the EMS panel shall be rated 300 volt, 60 degree C polyethylene insulation, chrome PVC jacketed, NEC-CM type. Conductors shall be Belden #8760 - #18 AWG, 1 pair, tinned copper, stranded (16 X 30) with 100% aluminum-polyester shield and #20 AWG tinned copper drain wire.
- D. All shields and drain wires on low voltage cable shall be attached to the appropriate grounding terminals as indicated on the EM drawings under Division 15.
- E. All low-voltage control wiring to the EMS shall be terminated in quick connect type clips. Use AMP plasti-grip or equal standard grade.

**PART 3 - EXECUTION****3.01 INSTALLATION**

- A. All low voltage conductors shall be PVC jacketed in conduit from the EMS panel up to the underside of the roof deck, then run exposed, parallel and perpendicular to the joists, bundled and tie-wrapped in a neat and efficient manner. Access to the roof top HVAC units shall be through ½" conduit stub-ups beginning in a 4" square junction box attached to the structural framing, then up through a 4" square steel pitch pipe (also to be used for power circuit access) onto the roof. Once on the roof, the conduit shall be converted to flexible waterproof "seal-tite" conduit before entering the HVAC unit control section through the exterior panel knockouts provided.
- B. It is the responsibility of the electrical contractor to determine in advance, all requirements of the local authorities of jurisdiction governing low voltage exposed cabling prior to submitting his base bid.
- C. Where exposed low-voltage PVC jacketed cabling is not allowed by local authorities, the ITS Contractor shall determine an alternate wiring system that is acceptable to the local authorities per the requirements of Section 16710.
1. First Option: Install NEC-CMP rated, type FPLP (low smoke producing, fire resistant) exposed cable.
  2. Second Option: Install all low voltage PVC jacketed cable in continuous EMT conduit between all terminations and connections.

The ITS Contractor shall notify the Home Depot immediately upon any requirement for alternate wiring. Home Depot shall then notify the electrical contractor, who shall provide and install the alternate wiring system.

**END OF SECTION**

**Construction Specification****OUTLET BOXES AND JUNCTION BOXES****PART 1 - GENERAL****1.01 RELATED DOCUMENTS**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section.
- B. Related work specified elsewhere includes but may not be limited to:
  - 1. Section 01012: Preferred Purchasing

**1.02 PREFERRED PURCHASING**

- A. Unless noted otherwise, Contractor and all subcontractors are encouraged to purchase all products listed in this specification section from a local The Home Depot Store. For more information, refer to Section 01012.

**1.03 LOCATION OF OUTLETS**

- A. Unless specifically indicated, all outlets are located diagrammatically on the drawings. Reference shall be made to architectural and mechanical plans for the exact location of all outlets. Outlets shall be located so that they will be symmetrical with architectural details and power outlets shall be so located as to properly serve the equipment.

**1.04 OUTLET BOXES**

- A. Provide all outlet boxes for lighting fixtures, wall switches, wall receptacles, telephones, etc., galvanized steel for concealed work, or cast type boxes, as specified. Provide cast ferrous alloy outlet boxes for all surface mounted wall switches and receptacles. Utility boxes are not acceptable.

**1.05 JUNCTION BOXES AND PULL BOXES**

- A. Furnish and install junction boxes as required to facilitate installation of the various conduit systems and as required by Article 370 of the NEC.

**PART 2 - PRODUCTS****2.01 OUTLET BOXES**

- A. Outlet boxes used in rigid conduit work exposed to weather shall be cast ferrous alloy type.
- B. Outlet boxes in ceiling and gypsum stud walls, shall be 4" square, or 4-11/16" square boxes. Plaster covers ½" in height shall be installed on boxes in walls and in acoustical tile ceilings. Boxes in concrete slab ceilings shall be concrete type.
- C. Outlets at origins of "home runs" to panelboards shall be 4-11/16" square outlet boxes.
- D. Outlet boxes recessed in concrete block walls and partitions shall be designed especially for installation in block and tile walls and partitions. Single-gang or multi-gang square cornered masonry boxes shall be used for one or more devices at the termination of a conduit run. Conventional 4" square or 4-11/16" square boxes fitted with square tile covers of proper depth for concrete block shall be used where two (2) or more conduits enter a box.
- E. Wall and column telephone outlets shall be 4" square, with ½" hole single device cover.
- F. Flush mounted outlet boxes in all exposed masonry walls shall be RACO or Steel City masonry type. The boxes and box covers shall have square edges and shall have the device mounting holes inside the box.
- G. Stamped steel outlet boxes shall be manufactured by Appleton Electric Company, RACO Manufacturing Company, or Steel City Electric Company.
- H. All boxes shall be identified with a permanent and indelible self-adhesive label. This label shall indicate the circuit number and source panelboard for all lighting, power, heating, and motor circuits. Likewise, all communications boxes for EMS, fire alarm, security, controls, voice, data, and POS cables shall be identified by system symbol and cable designation per the cable legend shown on the drawings. All labels shall be affixed to the interior back surface of the box.

**2.02 DEVICE BOXES**

- A. Device boxes shall be minimum 3"H x 2"W x 2-¾"D per gang, same manufacture as outlet boxes.

**2.03 JUNCTION BOXES AND PULL BOXES**

- A. Furnish and install all junction boxes required to facilitate the installation of the various conduit systems.

**Construction Specification****OUTLET BOXES AND JUNCTION BOXES**

- B. All junction and pull boxes shall be accessible with covers designed for quick removal. Where boxes are required to occur above a non-accessible furred ceiling in a finished area, the removable cover shall be flush with the finished ceiling. The exact location shall be approved by the Project Manager.

**2.04 INSULATED BUSHINGS**

- A. Insulating bushings shall be used in all pull boxes, tap boxes and switches.

**PART 3 - EXECUTION****3.01 OUTLET LOCATIONS**

- A. The location of any outlet, device or lighting fixture may be moved 10' with the prior approval of the Project Manager and before it is installed, without any additional expense to the Owner.
- B. This contractor shall check the location of all wall outlets including light fixtures, receptacles and switches, to verify that the outlets will clear any wall fixture, shelving, work tables, sinks, or similar equipment that will be installed.
- C. Outlets occurring in architectural features shall be accurately centered in same. Install wall switch outlets on the STRIKE SIDE of doors with coverplates clearing door trim.
- D. Outlet boxes in partitions shall NOT be set back to back. Boxes set side by side facing separate rooms or spaces, shall be nipped together by offset nipples. After conductors are pulled, the nipples shall be tightly packed with insulation to prevent sound transmission.
- E. The drawings are intended to show the locations of outlets, devices, fixtures and arrangement and control of circuits only. Exact locations shall be determined by actual measurement at the building and/or by reference to the architectural drawings.
- F. Outlet boxes shall be provided with 3/8" fixture stud to support light fixtures. Outlet boxes shall be firmly anchored to structural members of the building, using wood screws for wood construction, bolts for steel construction and expansion bolts secured in place with cement mortar for masonry construction. Ceiling outlets flush in furred acoustical tile ceiling construction for surface or pendant mounted lighting fixtures shall be 4" square or octagonal pressed steel boxes supported from stud and rod, bars or hangers supported from the building structure independent of the ceiling construction. For outlet boxes located between steel studs, provide Caddy No. BHA; and adjacent to studs, provide Caddy No. MSC.
- G. Junction boxes shall be provided with blank covers. Covers on ceiling outlets shall be round, and shall be painted to match ceilings.
- H. Covers on wall junction boxes shall be of size and finish as used on switch and receptacle outlets. Mark circuit number on each.
- I. Outlet boxes are to be flush mounted within stud wall partitions and surface mounted on concrete and/or masonry surfaces, unless specifically noted otherwise in drawings. Where recessed, the edge of outlet boxes shall be flush with the surface in which they are recessed. The devices that fit into the outlet boxes shall be screwed tight before the coverplate is installed, and the coverplate shall NOT be used as a means of tightening the devices in place.
- J. Where outlets are shown as being adjacent and different mounting heights are specified for each, they shall be mounted ONE DIRECTLY over the other, on the center line of the group or on the center line of the room or wall.
- K. The mounting height of all wall outlets is indicated on the architectural or electrical plans. The mounting height is from finished floor to the centerline of the device or outlet. The contractor may, with the Project Manager's approval on the job, slightly vary the mounting height of wall outlet so that the outlet box, top or bottom occur at a masonry joint.
- L. Boxes and enclosures for emergency circuits shall be marked with red labels saying "EMERGENCY" or in some other manner made clearly identifiable to electricians or maintenance personnel.

END OF SECTION

**PART 1 - GENERAL****1.01 RELATED DOCUMENTS**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section.
- B. Related work specified elsewhere includes but may not be limited to:
  - 1. Section 01012: Preferred Purchasing
  - 2. Section 16040: Identification
  - 3. Section 16100: Basic Materials and Methods
  - 4. Section 16120: Wire and Cables

**1.02 PREFERRED PURCHASING**

- A. Unless noted otherwise, Contractor and all subcontractors are encouraged to purchase all products listed in this specification section from a local The Home Depot Store. For more information, refer to Section 01012.

**1.03 SWITCHES, RECEPTACLES AND COVER PLATES**

- A. Provide switches, receptacles and cover plates as indicated on the plans and as specified herein.
- B. Color of general purpose devices shall be gray and installed with brushed aluminum or steel cover.
- C. Color of dedicated circuit devices shall be black (electrical panel "IS1" or "IS2") with black cover plates.
- D. Color of isolated ground devices shall be orange (electrical panel "R" or "CR") with orange cover plates.
- E. Color of standby devices shall be red (electrical panel "SB") with red cover plates.

**PART 2 - PRODUCTS****2.01 SWITCHES**

- A. Single pole toggle shall be Hubbell No. 1221.
- B. Three-way toggle shall be Hubbell No. 1223.
- C. Surface or flush mounted manual starters (with overload protection) for fractional horsepower motors shall be Square "D" Type FSJ-1P (flush) or Type FG-1P (surface).
- D. Remote start-stop push button stations shall be mounted in NEMA one (1) enclosure and shall be Square "D" Heavy-Duty Class 9001. Push button stations to be grouped or ganged shall be mounted in a NEMA one (1) sheet steel enclosure.
- E. Wiring devices equal to those described above as manufactured by Arrow Hart, Slater, Leviton, or Pass & Seymour are acceptable.

**2.02 OCCUPANCY SENSORS**

- A. Wall Switch with Adaptive Technology, Dual (passive infrared and ultrasonic-40kHz) shall be Hubbell No. ATD12771.
- B. Ceiling Sensor with Adaptive Technology, Dual (passive infrared and ultrasonic-40kHz), 2000 sq.ft coverage, with isolated relay and photocell shall be Hubbell No. ATD2000C.
- C. Control Units shall be CU120A (120V AC) or CU277A (277V AC).

**2.03 RECEPTACLES**

- A. General purpose receptacles shall be 20 Amp., 125V, Hubbell No. 5352 Gray.
- B. Dedicated circuit receptacles (electrical panel "IS1" or "IS2") shall be 20 Amp., 125V, Hubbell No. 5352 Black.
- C. Isolated ground receptacles (electrical panel "R" or "CR") shall be 20 Amp., 125V, Hubbell No. IG-5362 Orange (duplex) or Hubbell No. IG-8310 (single).
- D. Standby device receptacles (electrical panel "SB") shall be 20 Amp., 125V, Hubbell No. 5352 Red.
- E. Special receptacles as noted on drawings.

- F. Ground fault circuit interrupter receptacles shall be duplex, provide Class A (5 ma sensitivity) GFCI protection and shall be the feed-through type.
- G. Wiring devices equal to those described above as manufactured by Arrow Hart, Leviton, or Pass & Seymour are acceptable.

#### 2.04 MULTI-OUTLET STRIPS

- A. Multi-outlet Power Strips shall be 2000 Series Plugmold System as manufactured by Wiremold/Legrand. Provide single outlets at 18" on center maximum. Lengths as specified in drawings. Housing shall be steel with gray finish. Include all required accessories for a complete system.

#### 2.05 COVER PLATES

- A. Where the switch or device is flush mounted and located in public areas (such as public corridors, sales areas, etc.) the cover plates shall be aluminum, satin finish, oversized, as manufactured by RACO as available through Home Depot Pro Sales (unless noted otherwise).
- B. Where the switch or device is flush mounted and located in non-public areas (such as service corridors, storage rooms, electrical rooms, mechanical rooms, etc.), the cover plates shall be steel, smooth finish, oversized, as manufactured by RACO as available through Home Depot Pro Sales (unless noted otherwise).
- C. The Data Room, Vault Room, Training Rooms, Offices, Registers and receptacles in other similar type locations shall have colored nylon cover plates to match receptacle color as indicated above and in the construction drawings. Where 4" square boxes are used in these locations, a flat colored nylon cover plate or raised metal cover plate painted the appropriate color should be used as indicated in drawings.
  - 1. Black cover plates shall be Hubbell Wiring Device-Kellems NP8BK or equivalent
  - 2. Orange cover plates shall be Hubbell Wiring Device-Kellems NP8OR or equivalent
  - 3. Red cover plates shall be Hubbell Wiring Device-Kellems NP8R or equivalent
  - 4. Combination single/duplex raised metal covers shall be Raco 806C or equivalent. Paint as required above.
- D. Color of cover plate other than aluminum or steel shall be as selected by Project Manager.
- E. Cover plates for surface mounted devices on racks shall be formed steel with cadmium plating, Sierra "H" Series, or approved equal.
- F. Telephone outlet cover plates shall be similar to those materials as specified above and shall have a 5/8" bushed hole in the center, or RJ jack opening as required.
- G. Standard Weatherproof Coverplates: All outlets located outdoors in roof top units or in Garden Center areas shall be covered with standard gasketed covers such as Hubbell CWP8H and CWP26H.
- H. Weatherproof While in Service Covers: All outlets at wet locations where subjected to possible spraying of water, such as at the ceramic floor tile saw, shall be covered with "Weatherproof While in Service" covers. Use RACO/BELL Outdoor "Rayntite II" series; configuration as required for GFCI, standard duplex, telephone, data, single or double gang etc. Approved equal by Taymac is acceptable.

### PART 3 - EXECUTION

#### 3.01 INSTALLATION

- A. Where more than one device is indicated at a location, the devices shall be mounted in combined sectional gang boxes and covered jointly by a common plate.
- B. Light switches shall be installed on the strike side of doors as actually installed; advise Project Manager where drawings contradict.
- C. The Project Manager reserves the right to relocate any wiring device up to a distance of 10' from the location shown, before rough-in, without additional cost.
- D. All junction boxes, outlet boxes, sectional switch boxes, utility boxes, etc., shall be covered with a finished coverplate unless specifically noted otherwise.
- E. Contractor shall not install coverplates until after the final job visit by the Project Manager and Electrical Engineer.
- F. Refer to section 16040 for labeling of switches and receptacles.

END OF SECTION

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**Construction Specification**

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**MOTORS****PART 1 - GENERAL****1.01 RELATED DOCUMENTS**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section.

**1.02 MOTORS**

- A. Provide connections to all motors, starters, motor controllers, etc., as shown on the plans and herein specified.

**PART 2 - PRODUCTS****2.01 MOTOR AND MOTOR CONTROLS**

- A. All motors for mechanical heating, cooling and ventilation equipment together with their integral associated controllers, starters, speed control, relays, transformers, contacts, individual element protection, etc., shall be provided under other Sections of the specifications.

Except as otherwise specified herein, installation of external unit controllers, push buttons, contactors, etc., and external wiring to motors, controllers, push button stations, appliances, unit heaters, etc., shall be provided under this Section of the specifications.

Furnish and install all raceways and wiring complete, including all associated mounting devices.

Connection to all motors shall be in flexible metallic conduit 18" in length minimum and not exceeding 36" in length. In damp or wet locations flexible conduit shall be seal-tite (rated NEMA-3R) extruded PVC coated flexible EMT.

In addition, the electrical contractor shall furnish and install all:

1. External control and interlock wiring, including all conduit and outlet boxes.
2. External disconnect switches.

Note that all unit equipment, motor sizes, and locations indicated are approximate; make connections to equipment as actually installed. Before connecting any equipment, verify the nameplate data against the information shown on the drawings and advise the Architect and Engineer of any discrepancies.

**2.02 MOTOR STARTERS**

- A. Integral motor starters for HVAC units shall be provided by Division 15.
- B. External manual starters, (2 HP or less), for unit equipment and motors provided by Division 15, shall be provided by this Division.
- C. External starters for plumbing equipment motors, sump pumps, domestic water pumps, etc., shall be provided with the equipment under Division 15. External unit station control shall be provided by this Division.
- D. Refer to Division 15 drawings for all equipment location and unit requirements.
- E. Single phase motors not equipped with overload protection shall be connected with a manual motor starter, provided under this Division. Starter may be used for control or disconnect purposes.

**2.03 MISCELLANEOUS CONNECTIONS**

- A. Equipment furnished by the Owner or under other Divisions, shall be installed by others. This contractor shall furnish and install electrical service, service disconnect switches and make the electrical circuit connection to this equipment.
- B. Equipment such as Radial Arm Saw, Panel Saw and associated Vacuums furnished by Owner shall be installed and wired by E.C. Disconnects, motor starters, devices and warning lights shall be furnished and installed by E.C. Owner furnished keypads shall be installed by E.C.

**PART 3 - EXECUTION****3.01 MOTOR CONNECTIONS**

- A. Where connections are made to motors not near walls, or columns, a vertical conduit attached to floor and ceiling shall be installed and the wiring carried in and out of this conduit by means of condulets. Provide wood backboards for mounting equipment shown on the drawings. Mount motor starting and control equipment, wiring, cable troughs, conduit, and other required apparatus on a wood backboard. Backboards shall be made of B-D INT-DFPA grade plywood, painted gray on all sides. Backboards shall be supported by an angle iron frame. Frame and board to be painted light gray. Space shall be left on backboards for installation of equipment specified under other sections.

END OF SECTION



**Construction Specification****(FBO) UPS SYSTEM (APC)****PART 1 - GENERAL****1.01 SUMMARY**

- A. This Section covers UPS (Uninterruptible Power Supplies) Systems and accessories.

**1.02 SYSTEM DESCRIPTION**

- A. The APC (American Power Conversion) UPS (Uninterruptible Power Supply) system, with all required factory hardware, terminals, internal modules, etc., shall be provided by Home Depot. The chassis of the unit is installed by the electrical contractor, under this section. The UPS arrives with all of the modules pre-installed from the factory
- B. Any additional non-factory related devices or accessories such as the mounting hardware, support channel, external cabinet conduit, external circuit breakers, boxes, connectors, couplings, interface wiring between devices (exclusions as noted), line power circuits, etc. shall also be provided and installed by the electrical contractor.
- C. Electrical contractor shall include in his price, all labor and equipment rental necessary to completely install the UPS, as indicated on the plans, and perform all warranty work required during the warranty period (excluding internal component service and maintenance as provided for under the equipment factory warranty).

**1.03 FBO PROCEDURES**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section. General requirements related to Furnished by Owner (FBO) Items are as defined in Section 01010. All FBO Forms listed below are included as part of Section 01010.
- B. Vendor Contact: Contractor shall send a completed "FBO Form A: Contractor Information Form" to the FBO vendor indicated below, twelve (12) weeks prior to the scheduled installation of the specified system:

Mr. Michael Kubicki  
 American Power Conversion (APC)  
 132 Fairgrounds Road  
 West Kingston, RI 02892  
 Phone: 401-323-0950

- C. Take-Offs: FBO Vendor shall provide "take-offs" to the Contractor as specified in Section 01010. The Contractor shall then verify this "take-off" using an "FBO Form B: Take Off Confirmation Sheet".
- D. Receipt Of Shipment: Contractor shall verify shipment per the requirements of Section 01010 and complete the "FBO Form C: Confirmation of Shipment" and submit back to the FBO vendor. Electrical Contractor shall receive the UPS package at the site, review order for completeness and inspect all cartons and pallets for damage and correct labeling. Shortages and/or damaged materials shall be replaced by APC. Electrical Contractor must submit supplementary orders for replacement materials to the representative.
- E. Request for Changes: Changes to materials and quantities after receipt of shipment shall be coordinated by the contractor with the FBO vendor per the requirements of Section 01010 using an "FBO Form D: Request For Additional/Replacement Materials".
- F. Return Merchandise Authorization Policy: The Home Depot will add to the contractors' scope of work the responsibility for coordinating (1) customer accommodation return request through the FBO Vendor. Requests shall be submitted using the "FBO Form E: Returned Materials" as specified in Section 01010.
- G. Electrical Contractor shall schedule the installation date of the equipment with the Home Depot Construction Project Manager. The equipment must be installed and operational one (1) week prior to the Home Depot Information Services scheduled start-up date for the Data Room and HP store systems (typically two (2) weeks prior to turn over of the building to Home Depot for racking and merchandising). Coordinate all dates in advance with the Home Depot Construction Project Manager.

**1.04 APPARATUS**

- A. All apparatus and equipment specified hereinafter in this section fully conform to current standards of Underwriter's Laboratories and individually bear the UL seal, listing the appropriate standards
- B. All apparatus and material shall be of one and the same manufacturer.

**PART 2 - PRODUCTS****2.01 UNINTERRUPTIBLE POWER SUPPLIES**

**Construction Specification****(FBO) UPS SYSTEM (APC)**

- A. All Uninterruptible Power Supplies (UPS) are intended to be connected prior to the downstream loads they are to protect. All testing shall be "as the unit is installed", and not under ideal or laboratory conditions without consideration of the environment into which the unit will be permanently installed for operation.
- B. The most recent editions of the following standards shall be met for design, construction and testing:
  - 1. Underwriters Laboratories: UL1778
  - 2. CSA
  - 3. FCC-A, Part 15
  - 4. C-tick
  - 5. CE
  - 6. EN50091-2
  - 7. VDE
- C. The UPS shall be marked with a UL listed Short Circuit Current Rating of 100A.
- D. The UPS shall provide protection from surge currents and voltage spikes through the use of Double Conversion technology.
- E. All conductors leading to and from the UPS shall be sized according to the National Electrical Code in effect at the time of installation.
- F. Ground conductors for the UPS shall be sized in accordance with IEC 950.
- G. UPS devices shall be capable of operating in an ambient temperature range of 0 to 40 degrees C. Relative humidity to 95% non-condensing.
- H. UPS devices shall not produce audible noise greater than 62dBA at 1.5 meters.
- I. UPS devices shall have a Crest Factor Rating of up to 5:1.
- J. UPS devices shall not emit voltage distortion greater than +/- 5%.
- K. UPS output frequency shall not exceed +/-5% variance when synched to mains.
- L. The UPS shall have an Input Power Factor of at least 0.98.
- M. Each UPS shall have the means of bypassing the internal electronics to power the load in the event of a catastrophic failure.
- N. UPS Terminal connections shall accommodate #3 AWG for phase, neutral and ground conductors, which is the preferred wire size.
- O. The UPS device shall include REPO (Remote Emergency Power Off) capability and shall conform to Class 2 and SELV requirements when connected.
- P. All UPS systems shall have the ability to be remotely managed and controlled through a Local Area Network connection.

**PART 3 - EXECUTION****3.01 INSTALLATION**

- A. Input and output power wiring to the UPS shall be as short as possible with sufficient slack provided to allow for easy disconnection in the event of UPS failure or upgrade.
- B. All hard-wired UPS devices shall have an upstream disconnecting means for servicing.

END OF SECTION

**PART 1 - GENERAL****1.01 RELATED DOCUMENTS**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in the Section.

**1.02 GENERAL**

- A. The TVSS (Transient Voltage Surge Suppressor(s)) with all required factory hardware, terminals, internal modules, etc.... shall be provided and factory installed into switchgear by CPI (Carolina Products Incorporated) and will arrive to the site pre-assembled.
- B. Any additional non-factory related devices or accessories such as the mounting hardware, support channel, external cabinet conduit, external circuit breakers, boxes, connectors, couplings, interface wiring between devices (exclusions as noted), line power circuits, etc. shall be provided and installed by the electrical contractor.
- C. Electrical contractor shall include in his price, all labor and equipment rental necessary to perform all warranty work required during the warranty period (excluding internal component service and maintenance as provided for under the equipment factory warranty).
- D. The equipment must be installed and operational one (1) week prior to the Home Depot Information Services scheduled start-up date for the Data room and HP store systems (typically two (2) weeks prior to turn over of the building to Home Depot for racking and merchandising). Coordinate all dates in advance with the Home Depot Construction Project Manager.

- E. Shortages and/or damaged materials shall be replaced by CPI. There is a five (5) year warranty on parts. The electrical contractor must submit supplementary orders for replacement materials to the representative.

Once received, the electrical contractor shall take full responsibility for the storage and protection of all materials furnished by Home Depot.

- F. Changes to materials after receipt of shipment shall be coordinated by the electrical contractor with the representative at APC immediately upon receipt of revised plans. The associated change in materials and additional labor costs shall be submitted by the electrical contractor to the general contractor to be forwarded to the Home Depot Project Manager for approval.
- G. It is the responsibility of the electrical contractor to store and protect all materials furnished by Home Depot to the electrical contractor for installation. Refer to specifications section 16100.

**1.03 APPARATUS**

- A. All apparatus and equipment specified hereinafter in this section fully conform to current standards of Underwriter's Laboratories and individually bear the UL seal, listing the appropriate standards
- B. All apparatus and material shall be of one and the same manufacturer.

**PART 2 - PRODUCTS****2.01 TRANSIENT VOLTAGE SURGE SUPPRESSORS**

- A. All Transient Voltage Surge Suppressors (TVSS) shall meet the requirements of IEEE C62.41.2 Cat. A, B, and C for each appropriate environmental application. All TVSS devices are intended to be connected in parallel with the downstream loads they are to protect. All TVSS devices shall meet the testing standards of IEEE C62.45 without exception. All testing shall be "as the unit is installed", and not under ideal of laboratory conditions, without consideration of the environment into which the unit will be permanently installed for operation.
- B. The most recent editions of the following standards shall be met for design, construction and testing:
  - 1. IEEE C62.41.1-2002, C62.41.2-2002, C62.45-2002, C62.48-1996
  - 2. Underwriters Laboratories: UL1449 Second Edition & UL1283
  - 3. NFPA 70 (National Electric Code), Article 285
  - 4. NFPA 20, 75, and 780
- C. TVSS shall be Listed to 1449 Second Edition and UL 1283.
- D. TVSS shall be marked with a UL listed Short Circuit Current Rating of 200kA.
- E. TVSS shall provide surge current diversion paths for all modes of protection: L-N, L-G, N-G in WYE systems, and L-L, L-G in DELTA systems.

- F. Each mode of protection shall incorporate a thermal cutout device.
- G. UL 1449 listed Suppressed Voltage Ratings (SVRs) marked on the device shall not exceed:

VOLTAGE	L-N	L-G	N-G	MCOV
208Y/120	330V	330V	330V	150V
240S/120	330V	330V	330V	150V
480Y/277	700V	700V	700V	320V

- H. TVSS devices shall be provided in 80kA per phase capacities.
- I. TVSS shall have a minimum EMI/RFI filtering of -50dB at 100kHz.
- J. TVSS devices shall be capable of operating in an ambient temperature range of -40 to 50 degrees C. Relative humidity to 95% non-condensing.
- K. TVSS devices shall be equipped with an audible alarm that provides immediate failure notification when suppression circuitry has been damaged by a heavy strike or surge.
- L. TVSS device shall be capable of continuous operation at not less than 110% of the nominal system voltage.
- M. TVSS devices rated operating characteristics shall not vary with input frequencies varying from 47 to 63 Hertz.
- N. The TVSS devices shall be based on symmetrical Metal Oxide Varistor (MOV) array design. No circuit design in the TVSS shall include gas-tubes or silicon avalanche diodes (SAD's).
- O. Each TVSS shall have indicating LED(s). When the LED is illuminated, the mode or phase shall be operating properly, and providing full protection to downstream loads. Failure of any single MOV shall cause the mode or phase to indicate a failure.
- P. Terminal connections shall accommodate #8 AWG for phase, neutral and ground conductors, which is the preferred wire size.
- Q. Where indicated on the plans or by catalog number, the TVSS device shall include auxiliary Form C contacts (NO and NC) for remote monitoring capability.

### PART 3 - EXECUTION

#### 3.01 INSTALLATION

- A. Lead wires for TVSS devices shall be as short and straight as possible. Sharp bends in lead wires shall be avoided. In order to keep lead wires as short as possible, TVSS should be mounted as close as possible to its upstream disconnecting means so as to avoid extending the manufacturer supplied lead wires.
- B. Lead wires shall be twisted together from the point of connection in the panel it protects to the terminating lugs inside the TVSS enclosure.
- C. All TVSS devices shall have an upstream disconnecting means for servicing.

END OF SECTION

## PART 1 - GENERAL

## 1.01 SUMMARY

- A. This specification covers the electrical characteristics and general requirements for installation of the switchgear and related components
- B. Related Work specified elsewhere includes but not limited to:
  - 1. Section 01010 - Furnished By Owner Items (FBO)
  - 2. Section 15952 - Controls
  - 3. Section 15960 - Energy Management Controls and Commissioning
  - 4. Section 16040 - Identification
  - 5. Section 16120 - Wire and Cables

## 1.02 GENERAL

- A. The switchgear together with all required factory hardware, accessories, enclosures, pull sections, auxiliary sections, C.T. compartments, pulse-meter, barriers, bolted pressure switches, fuse clips, nameplates, panelboards, ground bars, transformers, transformer mounting kits, disconnect switches, safety switches, separate starters, combination starters, thermal overloads, contactors, service entrance transient voltage surge suppressors, lugs, bussing, controls, fuses, fusible switches, breakers, GFI monitors, relays, etc. shall be furnished by Home Depot, and installed by the electrical contractor, under this Section.
- B. The external electrical equipment (loose gear) shall be furnished by the electrical equipment vendor (FBO) and installed by the Contractor and shall include, but is not limited to:
  - 1. Lighting and appliance panels w/breakers
  - 2. Self-contained transformers
  - 3. Disconnect switches w/fuses (as applicable)
  - 4. Contactors and Relays (as scheduled)
  - 5. Radiant heater manual switches
  - 6. Radial arm/panel saw components (i.e. disconnect switches).
  - 7. Battery charger pushbuttons.
  - 8. Sales area 6" x 6" hinged wireway systems (mounting hardware shall be provided by electrical contractor per installation details).
  - 9. Shunt trip protection, if required.
  - 10. Raceways

**Note:** Electrical contractor shall provide all other electrical devices (not listed) as required per construction documents. Refer to 1.02°C (this spec) for additional information.

- C. Any additional required devices or accessories not factory-installed such as the mounting hardware, vibration isolators, support rods, straps, support channel, external cabinet conduit, boxes, connectors, couplings, interface wiring between devices, line power circuits, internal wiring between devices, accessory relays, etc. shall be provided by the electrical contractor.
- D. Electrical contractor shall include in his price all labor and equipment rental necessary to completely install the switchgear as indicated on the plans, and shall perform all warranty work required during the warranty period.
- E. All conduit, wire, couplings, connectors, clamps, adapters or any other required electrical accessories not factory-installed shall be provided by the electrical contractor as indicated on the plans. Major wireways that cross the store sales area serving rack power and lighting shall be furnished by Home Depot and installed by the electrical contractor.

## 1.03 FBO PROCEDURES

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section. General requirements related to Furnished by Owner (FBO) Items are as defined in Section 01010. All FBO Forms listed below are included as part of Section 01010.
- B. Vendor Contact: Contractor shall send a completed "FBO Form A: Contractor Information Form" to the FBO vendor indicated below, twelve (12) weeks prior to the scheduled installation of the specified system:

Adam Worth  
Carolina Products, Inc.  
1132 Pro Am Drive  
Charlotte, NC  
Phone: (704) 364-9029 (Ext 248) or Toll Free: (800) 736-4455  
Fax: (704) 367-1215  
E-Mail: adamw@cpipanel.com

- C. Take-Offs: FBO Vendor shall provide "take-offs" to the Contractor as specified in Section 01010. The Contractor shall then verify this "take-off" using an "FBO Form B: Take-Off Confirmation Sheet".

- D. Receipt of Shipment: Contractor shall verify shipment per the requirements of Section 01010 and complete the "FBO Form C: Confirmation of Shipment" and submit back to the FBO vendor.
- E. Request for Changes: Changes to materials and quantities after receipt of shipment shall be coordinated by the contractor with the FBO vendor per the requirements of Section 01010 using an "FBO Form D: Request For Additional/Replacement Materials"
- F. Return Merchandise Authorization Policy: The Home Depot will add to the contractors' scope of work the responsibility for coordinating (1) customer accommodation return request through the FBO Vendor. Requests shall be submitted using the "FBO Form E: Returned Materials" as specified in Section 01010.

#### 1.04 APPARATUS

- A. All apparatus and equipment specified hereinafter in this section shall fully conform to current standards of NEMA to the extent applicable to each type and class of equipment and apparatus described; and shall individually bear the seal of the Underwriter's Laboratories. When being utilized in Canada, all apparatus and equipment shall individually bear the CSA seal. Labeled equipment shall meet or exceed all of the requirements of performance testing under UL 891.
- B. All apparatus and material shall be of one and the same manufacturer, unless specifically indicated otherwise.
- C. The types, classes, and catalog numbers of materials and devices hereinafter stated are employed to establish the quality of apparatus and equipment required for this work.

### PART 2 - PRODUCTS

#### 2.01 MAIN DISTRIBUTION PANELBOARDS

- A. The Contractor shall install as herein specified, and where indicated on the plans, series-rated, indoor, totally-enclosed, dead front, low-voltage, distribution panelboards in accordance with the latest applicable standards of NEMA and UL. Panelboards shall be listed as suitable for use as service entrance equipment. Rating shall be for 480/277 volts, 3 phase, 4 wire service, in the ampere capacity as indicated on the plans.
- B. Panelboard enclosure shall be constructed of steel with rigidity and gauge in accordance with UL 50. Trims on equipment in the enclosed electrical room shall be complete without doors, while all other equipment outside of this room shall be complete with doors containing three-point latch and vault lock. All locks shall be keyed alike. Enclosure and trims shall be finished with rust inhibiting prime coat with baked-on enamel finish coat in manufacturer's color, or as an unpainted metal treated to equally withstand rusting as a painted enclosure, whichever is more cost effective. Wiring gutters shall be sized in accordance with UL 67. Integrated sections may be 1/8" brushed aluminum with strength and rigidity in accordance with UL891.
- C. Bus structure and main breaker shall have current ratings as indicated on the drawings. The bus bars shall be of such size, quantity and spacing so that, under fully loaded conditions, the temperature rise shall not exceed 50°C above ambient. Heat tests shall be conducted in accordance with UL 67.
- D. All bus bars shall be silver-plated copper having a conductivity of not less than 98% of that of pure copper. Plating shall not blister or peel, and shall be resistant to corrosion if scored or scratched. Bus plating shall be resistant to galvanic action between copper and dissimilar metals.
- E. Each panelboard, as a complete unit, shall have a short circuit rating equal to or greater than the minimum integrated AIC rating indicated on the drawings. The short circuit rating may be determined on a "Series Rated System" basis. The panelboard series rating shall be determined for the main circuit breaker and branch circuit breaker combination tested in accordance with UL 489. If series rated system is provided, each panelboard shall be clearly labeled as such with a warning describing selection of acceptable replacement circuit breakers.
- F. The main distribution panelboards shall have a ground bus and 100% neutral bus. Provide with full size grounding strap connecting the ground and neutral bus. Interconnection between these two busses shall occur only in panelboards used as service entrance equipment.
- G. All distribution circuit breakers shall be manually operated, thermal-magnetic, automatic tripping, of the ampacity and poles as scheduled on the plans, and quick-make/quick-break type. Breakers shall be over-the-center toggle operating type, with the handle going to a position between "ON" AND "OFF" to indicate automatic tripping. All multi-pole breakers shall have internal common trip.
- H. All circuit breakers, including any connectors to the main bus shall be bolt-on type and rigidly braced.
- I. All feeder breakers within the main distribution switchboard/panelboards shall be factory wired to the associated panelboards. Wire markers shall be utilized to identify the conductors and matched on both ends with panel designation and phase markings. Where shipping splits are shown, provide adequate wire and associated barriers, conduit, and other necessary materials for contractor connection. The switchboard/panelboard manufacturer shall connect and secure either the line or load side of each connection on shipping splits.

- J. Spaces for future installation of molded case circuit breakers are specified by the frame size. The spaces shall be complete with all bus and required bus connectors such that future breakers can be installed without adding or changing bus connectors on the main bus and without using a larger (frame size) or more expensive breaker than the trip size and interrupting capacity would require.
- K. A pulse-meter that is compatible with Novar shall be provided, installed, and connected to the EMS wiring harness by the panel manufacturer vendor. Pulse meter current transformers shall be bus mounted or mounted upstream of secondary phase lugs. Panel manufacturer shall also provide, install, and wire current transformer shorting blocks. Shunt block shorting bars shall be in the shorting position when the panel assemblies are shipped. All phase related wiring shall be color coded per Home Depot Wiring and Cabling Specification 16120. Panel manufacturer shall also provide, install, and wire all required disconnects and fuses for the meter power supply.

## 2.02 STANDARD PANELBOARDS

- A. Panelboards shall be of the automatic circuit breaker type, factory assembled by the manufacturer of the circuit breakers. Panelboards shall be new and the manufacturer's latest standard catalogued design. Panelboards shall be the product of the same manufacturer as the cabinets and shall bear UL labels. Panelboard bussing shall be 98% conductivity silver-plated copper.
- B. Panelboards shall be for service voltage with number of branch circuits of capacity scheduled. Unless otherwise indicated, panels and sections thereof shall have main lugs only of capacity equal to or greater than the rating or setting of the over current protective device next back on line.
- C. Panelboard boxes shall be constructed of code gauge steel, 20" minimum width by 5 3/4" deep. Panels having through feed shall have 8" bottom and side gutters. Where used as a raceway, provide additional space in panelboard box to meet NEC 384-25.
- D. Panelboard trims shall be flush or surface type as scheduled on the plans, constructed of code gauge steel, finished with rust inhibiting prime coat and baked-on enamel finish, or raw metal with a rust-inhibitor of the same quality as painting, whichever is more cost effective. Trims shall be complete with indicating adjustable trim clamps, door with chromium plated combination cylinder lock and catch, and directory of glass or clear plastic. All locks shall be keyed alike. Directory shall be type-written with spares indicated in pencil. All panel trims shall have an angle bracket welded to the back near the bottom to support the weight of the trim. Trims exceeding 48" in height shall have vault handle and three point latch system. The trims on all flush mounted 20" wide panels shall have trim clamps and hinges concealed when the door is closed. Trims shall not be removable with the door in the locked position. Trims on panelboards located within the enclosed electrical room require no door, and shall not be provided with one.
- E. Circuit breakers shall be thermal-magnetic molded case type quick-make/quick-break both on manual and on automatic operation. Breakers shall be of the over-the-center toggle operating type, with the handle going to a position between "ON" and "OFF" to indicate automatic tripping. All multi-pole breakers shall have internal common trip, and have all load side connectors off the same gutter. These shall be bolt in type, heavy-duty devices.
- F. Panel boards shall be as scheduled. Circuit breakers in panelboards shall have interrupting capacity as scheduled. Breakers intended to interrupt more than 10,000 amperes shall be labeled to conform to N.E.C. Article 240-83. Low voltage panels shall have main breakers as scheduled on the drawings.
- G. Special panelboard arrangements shall be provided as indicated on the drawings.
- H. Minimum clearance between circuit breaker and vertical panel section shall be three (3) inches.
- I. Panel board sections greater than forty-five inches shall have hinged door sections.

## 2.03 DRY-TYPE TRANSFORMERS

- A. Dry-type transformers shall have capacity, voltage ratings and characteristics as shown on the plans. Dry-type transformers shall conform to the requirements as herein specified.
- B. All transformers located within the enclosed electrical room shall be incorporated into the integrated switchboard/panelboard assembly. Cabling or bussing shall be as noted in section 2.01.
- C. All transformers located outside of the enclosed electrical room shall be stand alone dry-type transformers as described below.
- D. Transformers shall be provided with either (4) or (6) 2 1/2%-rated KVA taps on the primary winding. The dry-type transformers herein specified shall have noise levels not exceeding 45 dB for transformers rated 50 KVA and below. Noise levels shall be determined in accordance with NEMA standards for specialty dry-type transformers. The transformers shall be supported on approved vibration and noise dampening supports.
- E. All conduit connections to the transformers shall be made with flexible metallic raceway or shall be made with other approved vibrationless connectors. The length of the flexible metallic raceway in use shall be not less than 18".

- F. Each dry-type transformer shall be provided with a terminal lug compartment (lugs ordered separately, field installed) for transformers above 25 KVA, and factory installed terminal lugs for transformers rated 25 KVA and below, supported and arranged for the feeder terminations and for side or bottom entrance of the terminal compartment. Temperature in compartment shall not exceed 75°C at rated load with an ambient of 40°C. Lugs for transformers shall be provided separately with the transformer.
- G. Transformers shall have primary and secondary voltages as indicated on the plans, with a minimum of (2) 5% FCBN taps up to 15 KVA and (4) 2 1/2% FCBN on all sizes larger. Transformers shall have UL recognized 220°C insulation system and shall be so designed that under full load the average conductor temperature rise does not exceed 150°C rise above 40°C or ambient at any point on the enclosure. Conduit entrances and terminal board shall be located at the bottom of the enclosure.
- H. The design, manufacture, testing, method of conducting tests and preparation of reports shall be in accordance with the latest revision of NEMA Standards Publication for Specialty Transformers No. ST 1-4 (ASA C89.1), modified to require separate primary and secondary winding for each dry-type transformer.

#### **2.04 DISCONNECT SWITCHES**

- A. Sub-feeder switches and disconnect switches shall be "Heavy-Duty" rated, except as otherwise noted, and in damp locations or exposed to the weather shall be NEMA-3R (Raintight). Disconnect switches shall be horsepower rated for the motor installed.
- B. Manual starters for single phase motors sized 1 horsepower and below shall be NEMA-1 general purpose for dry locations and NEMA-4 watertight for damp locations or where the switch may be exposed to the weather. Provide with number of poles as noted on drawings where used for control of multiple circuits/motors.
- C. All disconnect switches shall have factory installed provisions for padlocking in either the "ON" or "OFF" position.
- D. Unless otherwise noted, disconnect switches shall be of the same manufacture as the main switchboard and panelboards.
- E. All switches shall have nameplates as specified in another section of this specification.

#### **2.05 PADLOCKS**

- A. The electrical contractor shall provide (2) forged brass padlocks on all fused and non-fused disconnect switches located outside of the building at grade level. One lock shall be used to lock the switch door to prevent unauthorized opening, and the other shall be used to lock switch in the "OFF" or "ON" position.
- B. Padlocks shall be pull-on operation, seven-pin tumblers, equal to Best Manufacturing Company. All locks shall be keyed alike and furnish (2) keys to owner's representative for each lock.

#### **2.06 FUSES**

- A. All fuses shall be of the same manufacturer. All fuses shall be of the high interrupting rating, current limiting type as manufactured by Bussman or Gould-Shawmut. Fuses shall be provided for each fuse cutout and the specified quantity of fuses shall be furnished for spares.
- B. Circuits of 0 to 600 amperes shall be protected by rejection type, current-limiting Bussman Lowpeak Dual Element Fuses LPN-RK (250 volts) or LPS-RK (600 volts). All dual-element fuses shall have separate overload and short-circuit elements. Fuse shall incorporate element having a 284°F melting point alloy and shall be independent of the short-circuit clearing chamber. The fuse shall hold 500% of rated current for a minimum of 10 seconds and be UL-listed, with an interrupting rating of 100,000 amperes RMS symmetrical. The fuses shall be UL Class RK-1.
- C. Motors, transformers or other circuits with heavy inrush currents of 0 to 600 amperes shall be protected by rejection type, current limiting Bussman Lowpeak Dual Element Fuses FRN-R (250 volts) or FRS-R (600 volts). All dual-element fuses shall have separate overload and short-circuit elements. The fuse shall hold 500% of rated current for a minimum of 10 seconds and be UL-listed, with an interrupting rating of 100,000 amperes RMS symmetrical. The fuses shall be UL Class RK-5.
- D. Circuits of 601 to 6000 amperes shall be protected by current-limiting Bussman HI-CAP Time Delay Fuses KRP-C. Fuses shall employ "O" rings as positive seals between the end bells and the glass melamine fuse barrel. The terminals shall be peened. Fuses shall be time-delay and shall hold 500% of rated current for a minimum of 4 seconds, clear 20 times rated current in 0.01 seconds or less and be UL-listed, with an interrupting rating of 100,000 amperes RMS symmetrical. The fuses shall be UL Class L.

#### **2.07 EQUIPMENT ANCHORING**

- A. All items of electrical equipment, such as main service switch, transformers etc., shall be securely anchored to the building structure. The anchoring shall be accomplished by utilizing a minimum size of 1/2" steel threaded rods secured



to the structural steel in the structure and to the item of equipment. A minimum of (2) rods shall be provided on each side of each item of equipment with the following exceptions:

1. If the equipment manufacturer provides more than (2) anchor holes per side in the base frame of the equipment item, then there shall be one anchor for each anchor hole.
2. If the equipment manufacturer recommends a particular quantity greater than two (2) per side, then that quantity of anchors shall be utilized by the contractor.

## **2.08 CONTACTORS**

- A. Contactors for the control of branch circuits and branch circuit panelboards as shown shall have number of poles, throws and ampere ratings as indicated. Contactors shall be provided with proper enclosures for surface or flush mounting as shown. Emergency contactors shall be electrically held with normally closed contacts. Non-emergency contactors shall be provided as called out on the design drawings. Contactor coil voltages shall be 120 VAC. Control circuits shall be properly coordinated with energy management system and other control devices and all necessary relays and control miscellaneous appurtenances shall be furnished. All contactors shall be furnished with manual override.

## **2.09 WIRING/TERMINATIONS**

- A. Small wiring, necessary fuse blocks and terminal blocks within the switchboard shall be furnished as required. Control components mounted within the assembly, such as fuse blocks, relays, pushbuttons, switches, etc, shall be suitably marked for identification corresponding to appropriate designations on manufacturer's wiring diagrams.
- B. All control wire shall be type SIS, bundled and secured with nylon ties. Insulated locking spade terminals shall be provided for all control connections, except where saddle type terminals are provided integral to a device. All current transformer secondary leads shall first be connected to conveniently accessible short-circuit terminal blocks before connecting to any other device. All groups of control wires leaving the switchboard shall be provided with terminal blocks with suitable numbering strips. Provide wire markers at each end of all control wiring.
- C. The switchboard manufacturer shall wire and mark as factory-installed all panelboards, transformers and/or automatic transfer switches from the associated feeder breaker (in the Main section of the switchboard) to the panelboard as noted on drawings. This wiring shall not be done in the field
- D. Pre-wired terminal blocks shall be provided in the switchgear lineup for interconnection of devices controlled by energy management. Separate terminal blocks for Class 2 and 120 VAC wiring shall be provided. Class 2 connections and 120 VAC connections shall not be allowed on the same terminal strip. Terminals shall be numbered and terminated as per Home Depot drawings. Terminal blocks shall be located in the front portion of the panel section so as not to interfere with feeders or branch circuit conductors.
- E. All wiring shall comply with the Home Depot Wiring and Cabling Specification 16120. Any Class 2 cabling internal to the integrated panel assemblies shall be 18 AWG shielded cable with 600 Volt insulation.
- F. Interconnection of Novar Class 2 wiring and Novar contactor control wiring between panel shipping splits shall be modular plug and play connections. Class 2 connectors shall have a different number of pin connections compared to line voltage connections so that it is physically impossible to connect Class 2 wiring connectors to line voltage connectors.
- G. Panel manufacturer shall provide detailed, easy to understand assembly instructions with integrated panel assembly for electrical contractor use. Wiring diagrams and text instructions shall be provided as required for proper assembly.

## **2.10 WIREWAYS**

- A. Wireways 8" and larger shall be 14 gauge galvanized steel, 6" and lower shall be 16 gauge, both with hinge or screw covers as noted on the plans.
- B. Wireways shall be coated with a corrosion inhibitor.
- C. Wireways shall be NEMA-1 (indoor) or NEMA-3R (outdoor) as noted on the plans. NEMA-3R wireways shall have a gasketed cover.
- D. All wireways excluding those in the sales area shall be primed and finished with dark gray enamel inside and out.

## **2.11 PANELBOARD CONTROLLERS / BREAKER INTERFACE**

- A. Panelboard controllers shall be sized to control no fewer than 42 circuits per controller.
- B. Controller shall be integral to panel, with control wiring pre-wired by integrated panel manufacturer.
- C. Controller shall be fully compatible with Novar.
- D. Controllers shall be mounted in the panel sections so as not to interfere with feeders or branch circuit conductors.

- E. A service loop shall be provided for each controller for the communication link connection.

## 2.12 CONTROLS EQUIPMENT

- A. Control equipment shall be provided by others per the requirement of Section 15952. Panel manufacturer shall install controls equipment into manufactured equipment as required to provide an integrated system.

## 2.13 IDENTIFICATION

- A. Factory install master nameplate indicating switchboard designation, voltage ampere rating, short-circuit rating, manufacturer's name, general order number, and item number.
- B. Control components mounted within the assembly, such as fuse blocks, relays, pushbuttons, switches, circuit breakers, etc. shall be suitably marked for identification corresponding to appropriate designations on manufacturer's wiring diagrams.
- C. Labels:
  - 1. All labels shall have 3/8" high white letters.
  - 2. Provide a 4" x 1-1/2" red finish, heat resistant adhesive label for each 277/480 volt switchboard, distribution switch/breaker, panelboard, disconnect switch, contactor, etc.
  - 3. Provide a 4" x 1-1/2" black finish, heat resistant adhesive label for 120/208-volt switchboard distribution, panelboard, disconnect switch, contactor, transformer, etc.
  - 4. Provide a 4" x 8" black finish, heat resistant adhesive label on the main switch.
  - 5. Location: Labels for surface, flush or recessed mounted equipment shall be installed on the exterior of equipment.
- D. Refer to Section 16040 for additional identification requirements.

## PART 3 - EXECUTION

### 3.01 FACTORY TESTING

- A. The following standard factory tests shall be performed on the equipment provided under this section. All tests shall be in accordance with the latest version of ANSI and NEMA standards.
- B. The switchboard shall be completely assembled, wired, adjusted, and tested at the factory. After assembly, the complete switchboard shall be tested for operation under simulated service conditions to assure the accuracy of the wiring and the functioning of all equipment. The main circuits shall be given a dielectric test of 2200 volts for (1) minute between live parts and ground, and between opposite polarities. The wiring and control circuits shall be given a dielectric test of 1500 volts for (1) minute between live parts and ground.
- C. The manufacturer shall provide (1) certified copy and an electronic version (PDF format) of factory test reports.
- D. Factory tests as outlined above shall be witnessed by the owner's representative if requested.

### 3.02 INSTALLATION

- A. Contractor shall examine all terminations on switchgear upon installation and re-torque, as necessary, per the manufacturer's recommendations.
- B. Shop drawings shall indicate that all of the function requirements of the specifications have been met. In addition, the UL-approved RMS symmetrical interrupting capacity shall be indicated for each circuit breaker, and a certification that these are UL ratings shall be attached.
- C. Contractor shall provide 4' x 8' x 3/4" wood backboards made of B-D INT-DFPA grade plywood, painted gray al sides, securely anchored to all walls of telephone and main electrical room as indicated on the plans. Backboards shall be continuous from floor to 8' high and wall to wall (excluding masonry openings).
- D. Contractor shall provide a 4" high reinforced concrete housekeeping pad under any floor mounted electrical equipment.
- E. The Home Depot will **not** furnish to the electrical contractor for installation, all electrical room 12" x 12" screw cover wireway above or below panelboards and contactors for conduit entry. The contractor may purchase and install this at his own cost if he feels that this will simplify installation. Emergency circuits shall not enter this wireway.
- F. The Home Depot will furnish to the electrical contractor for installation, all 6" x 6" hinge cover wireways for power and lighting in the sales area as indicated on the plans. Normal and Emergency circuits shall not be run in the same wireway.

### 3.03 STARTUP AND COMMISSIONING

- A. Refer to Section 15960 - Energy Management Controls and Commissioning

END OF SECTION

**PART 1 - GENERAL****1.01 RELATED DOCUMENTS**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section.

**1.02 GENERAL**

- A. Electrical contractor shall make all arrangements with the electrical utility that are necessary to obtain electrical service, both temporary and permanent.
- B. Metering cabinets to house metering devices (meter, current transformers, potential transformers, etc.) shall be provided by contractor and installed as directed by the electric utility company. This contractor shall make all provisions necessary for the installation of the electric utility metering equipment in accordance with utility company.

Pulse metering and monitor circuit shall be provided to the energy management system. The pulse meter is to come integral with the FBO electrical switchgear. Contractor shall ensure that all connections are complete for utilization.

- C. Electrical contractor shall make all arrangements for temporary electrical service to the site during the construction phase and maintain electric service to existing facilities as required.
- D. Transformer, pads, barriers, clearances and primary service shall be provided and installed as directed by the electric utility company rules, regulations and installation guide.

**PART 2 - PRODUCTS****2.01 SERVICE ENTRANCE CABLES**

- A. Install service entrance cables as shown on drawings and as specified herein.
- B. All materials and methods of construction for service provisions shall comply with the electric utility company requirements.
- C. Contractor to provide additional trenching and conduit as directed on drawings.

**PART 3 - EXECUTION****3.01 INSTALLATION**

- A. Obtain all necessary standards and detail drawings from the electric utility company before building construction or excavation adjacent to service equipment is started.
- B. Coordinate service and connections with the electric utility.
- C. Make arrangements with the Owner and the electric utility company to install, terminate, relocate, or transfer primary electric service without disruption of the normal operation of the Owner's business, or any other electric services (eg., adjacent tenants ..., etc.) as required. Installation cost of the electric service should include provision for the work of both the electrical contractor and utility company (if so required) for non-normal work hours (eg., night-time or weekend ..., etc.).

**END OF SECTION**

**PART 1 - GENERAL****1.01 RELATED DOCUMENTS**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section.
- B. General requirements include those specified in Section 16010, "General Provisions," Section 16410A, "Electrical Primary Service," and as specified herein. The work includes the installation of a new pad mounted transformer and primary fusible disconnect switch with primary metering gear, surge arrestors (both furnished by Home Depot), for outdoor use. Manufacturer of transformer and primary switch assembly shall be Square D Company. All equipment shall be installed by the electrical contractor.
- C. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

ANSI C2	1990 National Electrical Safety Code
ANSI C57.12.26	1987 Transformer - Pad-Mounted Compartment-Type, Self Cooled, Three-Phase Distribution Transformers - dead front construction, for use with Separable Insulated High Voltage Connectors, High-Voltage 34,500 GrdY/19.920 Volts and Below; 2500 KVA and smaller; Low Voltage 480 Volts and Below- Requirements.
ANSI C57.12.28	Switchgear and Transformers, Pad-Mounted Equipment- Enclosure Integrity
IEEE C57.12.51	Requirements for Ventilated Dry-Type Power Transformers, 501kVA and Larger Three-Phase, with High Voltage 601-34,500 Volts, Low Voltage 208Y/120 – 4160 Volts
IEEE 386	1985 Separable Insulated Connector Systems for Power Distribution Systems Above 600V.
NEMA LAI	1976 (Rev. 1986) Surge Arresters
NFPA 70	1999 National Electrical Code

**1.02 PRIMARY ELECTRIC SERVICE**

- A. Electrical service shall be obtained from the local electrical utility company as selected by The Home Depot and SRI.
- B. Primary service devices, including pathways and conductors, from the point of tie in with the local utility company shall be provided by the electrical contractor. Electrical contractor shall include in his bid all charges for tie in with the local utility company.
- C. The Home Depot will provide the primary transformer and the primary load break switch with the primary metering section. All other material and labor necessary to complete the installation including the concrete pads and/or vaults will be provided by the electrical contractor.
- D. Electrical service shall be \_\_\_\_\_ volts on the primary and 480/277 volts, 3 phase, 4 wire, wye connected on the secondary.
- E. Electrical contractor shall obtain from the local electrical utility company their specification for the transformer/load break switch and pad/vault. The local utility's pad/vault specification shall be considered the minimum specification to be used.
- F. Electrical contractor shall submit the pad/vault specification for the transformer and the load break switch to the owner and owner's representative. The final pad specification will be such so as to ensure the stability of the transformer and the load break switch. Electrical contractor shall take into consideration existing site conditions and seismic requirements when submitting his pad specification. If in the opinion of the owner or owner's representative, added size, concrete, tie rods, or materials are warranted to promote the stability and integrity of the pad, the owner's opinion shall prevail at no additional cost to the owner.
- G. Upon completion of the electrical service, electrical contractor shall make arrangements with an independent testing agency designated by Home Depot project manager, who will then perform an installation check, to ensure all work has been performed per specifications.
- H. Any corrections to work requested by the testing agency, will be done at the expense of the electrical contractor. If a reinspection is required the electrical contractor will then bear the cost of the reinspection fee by the testing agency.
- I. Electrical contractor shall make all arrangements and take care of all costs necessary for temporary electrical service to the site during the construction phase, and maintain electrical service to existing facilities as required.
- J. Electrical contractor shall make all arrangements with the electrical utility that is necessary to obtain permanent electrical service.
- K. Metering and current transformers shall be furnished and installed as directed by the electrical utility company and the pulse meter vendor. The electrical contractor shall make all provisions necessary for the electrical utility company. Pulse metering and monitoring circuitry shall be provided to the energy management system. All costs for these services and devices shall be provided by the electrical contractor.

**PART 2 - PRODUCTS****2.01 SERVICE ENTRANCE CABLES**

- A. Install service entrance cables as shown on drawings and as specified herein.
- B. All materials and methods of construction for service provisions shall comply with the electrical utility company's requirements.

**2.02 PAD MOUNTED TRANSFORMER**

- A. Outdoor type, consisting of a high-voltage, (2.5, 5.0, 8.7, 15.0, 25.0, 34.5) kV, including incoming compartment with metering and load break as required by utility, transformer section and a low-voltage/secondary compartment separated by full height isolating barriers. Components shall be assembled and shipped by the FBO switchgear manufacturer as a unit, or the utility company if supplying, completely weatherproof and tamper proof for mounting on a concrete pad without additional housing, fences or other enclosures. Unit shall conform to applicable portions of ANSI standards noted above, modified as necessary to accommodate the components specified by the AHJ, serving utility, and herein. Component ratings shall be as indicated, and as specified herein.
- B. The incoming compartment shall be dead-front construction and shall include break connectors, insulated.
  - 1. Load break connectors shall be the separable insulated type rated (60 kV for the 15 kV class, 30 kV for the 5 kV class, 20 kV for the 2.5 kV class, 10 kV for the 1.2 kV class) basic insulation level (B.I.L.), 200 amps and in conformance with IEEE 386. Insulated bushings shall be compatible with the load break connectors.
- C. Transformers shall be 3-phase, radial feed, three winding, 60Hz, 65 degree C rise, oil insulated, self-cooled type rated at (1000) kVA capacity, high voltage (2.5, 5.0, 8.7, 15.0, 25.0, 34.5) kV delta primary, with two 2½ percent full capacity taps above and below rated primary voltage. (60 kV for the 15 kV class, 30 kV for the 5 kV class, 20 kV for the 2.5 kV class, 10 kV for the 1.2 kV class) kV basic insulation level; 480Y/277 volts secondary voltage. Provide exterior tap changer with position indicator for de-energized operation only. Locate change control handle within the high voltage compartment and provide means to prevent unintentional operation. Transformer shall have a sealed tank with a welded bolted and gasketed cover. Provide the following accessories:
  - 1. Drain and sampling valves. Filter press connections.
  - 2. Ground pads.
  - 3. Provisions for lifting and jacking.
  - 4. Top liquid dial-type thermometer without alarm contacts.
  - 5. Pressure-vacuum gauge.
  - 6. Liquid level gauge.
- D. Provide a transformer meeting or exceeding the following requirements:
  - 1. Aluminum windings
  - 2. Coils of high grade, grain oriented, non-aging silicon steel with high magnetic permeability and low hysteresis and eddy current losses
  - 3. Core and coil isolated from the enclosure
  - 4. Rubber isolation pads
  - 5. Separate high and low voltage compartments
  - 6. NEMA 3R enclosure (not NEMA 1 with rainshields)
  - 7. High voltage terminations with spade type terminals
  - 8. Standard NEMA type hole patterns on spade terminals
  - 9. Structural steel enclosure base
  - 10. Impedance no greater than 5.75%
- E. Include low voltage bushings, spade-type terminals.

**2.03 TRANSFORMER AND PRIMARY SWITCH PADS**

- A. 8-inch thick concrete pad minimum, placed on well-compacted gravel sub-base so that top surface of slab is 6 inches above grade. Size to allow 8 inches of free space on all sides of equipment. Reinforce with 6-inch by 6-inch number 6 mesh, uniformly placed 4 inches below top surface of slab. Chamfer edges ½ inch. Determine cable entrance space and location according to requirements of equipment to be mounted. Electrical contractor shall obtain utility company's pad specification and more stringent of the two shall be applicable.

**2.04 GROUND RODS**

- A. Electrical contractor shall provide copper clad steel, drive full length to a minimum depth of 6 inches below finished grade. Minimum dimensions of rods shall be ¾ inch diameter, and 10 ft. length. Number of rods and configurations shall be as approved by utility company.

**2.05 PRIMARY FUSIBLE DISCONNECT SWITCH**

- A. Fusible disconnect switch, outdoor, free-standing, pad mounted, constructed per power company standards with distribution class surge arrestors, and metering section. Metering CT's and PT's shall be as approved by utility company and provided by the electrical contractor if not provided by the utility company.

## **2.06 PRIMARY SERVICE FEEDERS**

- A. All Primary Service Entrance conductors shall be sized as indicated on the drawings. Insulation value shall be based on 100% as per utility company's standards.
- B. Conductors shall be stranded conductor, copper, shielded, rated for Primary Service Voltage listed on drawings with EPR or approved insulation, in underground raceway or direct buried as directed by utility company.
- C. Shielding shall be copper concentric neutral consisting of 26 #16 or 16 #14 or 10 #12 conductors. Tape shielding may be used in lieu of individual wires as per manufacturer's standard practice.
- D. Acceptable manufacturers:
  - 1. CABLEC Corp.
  - 2. General Cable Co.
  - 3. Kerite Co.
  - 4. Okonite Co.
  - 5. Pirelli Corp.
- E. Cable terminations shall be long barrel, hexagonal compression type suitable for wet locations. Single or multiple indent connections shall not be used.
- F. Acceptable termination manufacturers:
  - 1. Elastimold
  - 2. General Electric
  - 3. 3-M Corp.
  - 4. RayChem
  - 5. RTE Corp.
- G. Coordinate type and specification of primary service feeders and terminations with utility company from the point of view of future emergency replacement service by the local utility company.
- H. Prior to submitting a bid, the electrical contractor shall coordinate the exact length of primary cable required by the utility, based on the location the utility chooses for switchgear and primary metering equipment. The electrical contractor shall be responsible for any additional costs required in the event the electrical utility elects to relocate the primary equipment after bids have been submitted.

## **2.07 PRIMARY SERVICE ACCESSORIES**

- A. Electrical contractor shall provide and install all primary service accessories as indicated on the plans, except those installed by the serving utility. These include, but are not limited to, concrete vaults and/or pads, load break elbows, lugs, bussing, ground rods, controls, etc. All accessories shall be in accordance with utility requirements and shall be approved by the utility prior to purchase and installation. Any items not approved by the utility and installed by the contractor shall be replaced by the contractor at no cost to the owner.

## **2.08 INSTALLATION**

- A. Electrical contractor shall conform to the manufacturer's shop drawings and mounting instructions including securing the transformer and primary switch with metering section to the concrete slabs with a minimum of four anchor bolts each. Completed installation shall conform to the requirements of ANSI C2.

## **2.09 GROUNDING**

- A. Pad mounted transformer and primary switch shall have grounded pads, lightening arrestors connected to a solid earth ground using cone pointed drive ground rods in accordance with paragraph in this section entitled, "Ground Rods". Install as indicated to provide an earth ground having a maximum test resistance of 5 ohms.
- B. Buried or otherwise inaccessible ground connections, except those which specifically require access for periodic testing, shall be made by exothermic welds or compatible completely brazed mechanical connectors. Welds, which have "puffed-up" or have convex surfaces, indicate improper cleaning and will be rejected.

## **2.10 SIGNS**

- A. Install "DANGER HIGH VOLTAGE" signs on each side of pad mounted transformers and primary switch, except when the transformer and primary switch is surrounded by a fence, mount the signs on each side of the fence.

**2.11 FIELD QUALITY CONTROL**

- A. Upon completion of installation, the electrical contractor shall notify the Owner and the power company five (5) days in advance of the proposed operating test. Verify by demonstration that the equipment and devices are operating satisfactorily.
- B. Electrical contractor shall test ground rods for ground resistance value before connecting wire. Test each ground rod or group of rods with a portable ground testing megger, equipped with a meter that indicated the ground value of the electrode being tested directly in ohms or fractions thereof. Identify each ground and record test value.

**PART 3 - EXECUTION****3.01 INSTALLATION**

- A. Obtain all necessary standards and criteria drawings from the local electrical utility company before building construction or excavation adjacent to service equipment is started.
- B. Coordinate service and all primary connections with the local electrical utility company.
- C. Arrange and coordinate with the Owner and the local electrical utility company to install, terminate, relocate, or transfer primary electric service without disruption of the normal operation of the Owner's business, or any other electric services (e.g. adjacent tenants, ...etc.) as required. Installation cost of the electric service should include provisions for the work of both the electrical contractor and the local electrical utility company (if so required) for non-normal work hours (i.e. nighttime or weekend...etc.).

**END OF SECTION**

**PART 1 - GENERAL****1.01 SUMMARY**

- A. Provide a grounding system for the main building services and each separately derived system originating at the respective grounding electrode(s) and radiating to every electrical power controlling and consuming device in the system.
- B. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section.
- C. Related work specified elsewhere includes but is not limited to:
  - 1. Section 16110 - Raceways
  - 2. Section 16120 - Wire and Cables

**PART 2 - PRODUCTS****2.01 GROUND RODS**

- A. Provide UL listed 3/4" diameter by 10' long copperclad steel ground rods. Manufacturer: ERITECH.

**2.02 EXOTHERMIC WELDS**

- A. Provide exothermic copper welds with materials and configuration to match application.
- B. Manufacturer: CADWELD

**2.03 CLAMPS**

- A. Bronze, UL listed, with configuration to match application.
- B. Manufacturer: BURNDY; ILSCO; O.Z./GEDNEY.

**2.04 CONDUITS**

- A. See Section 16110 - Raceways.

**2.05 CONDUCTORS**

- A. Copper only, see Section 16120 - Wire and Cables

**PART 3 - EXECUTION****3.01 SERVICE ENTRANCE GROUNDING ELECTRODES**

- A. The grounding electrode system shall be in strict accordance with NEC article 250. The following electrodes shall be bonded to each other and to the main service entrance ground bus. Grounding electrode conductors shall be sized according to NEC article 250 unless noted larger on the drawings.
  - 1. The reinforcing bars in the wall footing near the service entrance shall be bonded together with # 4/0 bare copper wire. Reinforcing bars utilized shall be at least 20 feet in length, located near the bottom of the concrete footing and encased by at least 2 inches of concrete. Connect #4/0 bare copper to reinforcing bars with exothermic weld and route to main service entrance ground bus.
  - 2. Driven grounding electrode consisting of a ground rod driven with top 24" below grade. Install rod a minimum of 36" clear of foundation walls. Connect #6 bare copper conductor to ground rod with exothermic weld and route to main service entrance ground bus.
  - 3. Building Steel: Select a connection point on the building steel as close as possible to the domestic water service entrance that will also remain exposed.
  - 4. Domestic Water Pipe: Select a connection point on the domestic water pipe as close as possible to the point it enters the building and that will also remain exposed.
  - 5. Sprinkler Water Pipe: Select a connection point on the sprinkler water pipe as close as possible to the point it enters the building and that will also remain exposed.

**3.02 MAIN SERVICE GROUNDING ELECTRODES BONDING CONDUCTORS**

- A. Install a 4/0 bare stranded copper conductor between each grounding electrode and its closest grounding electrode neighbor so that all electrodes are bonded together.
- B. Exothermic weld each bonding connection both cable to cable and cable to grounding electrode.

**3.03 MAIN SERVICE GROUNDING ELECTRODE CONDUCTOR**



- A. Install a 4/0 bare stranded copper conductor from the service entrance grounding electrode to the service switchboard ground bus.
- B. Exothermic weld the connection to the ground rod pigtail and ground bus.

#### 3.04 SEPARATELY DERIVED SYSTEM GROUNDING ELECTRODE

- A. Select a local grounding electrode described by the National Electrical Code and make connection to a point permanently visible.

#### 3.05 SEPARATELY DERIVED SYSTEM GROUNDING ELECTRODE CONDUCTOR

- A. Install a stranded bare copper conductor sized according to NEC between the local grounding electrode and the separately derived system grounded conductor.
- B. Exothermic weld the grounding electrode conductor to the grounding electrode.

#### 3.06 ADDITIONAL BONDS

- A. Gas Service Pipe: Bond Gas Service Pipe at the first accessible point nearest its entry to the building to the nearest main service ground electrode with a No. 4/0 bare stranded conductor.
- B. Exothermic weld the connection at grounding and electrode and to a ground clamp at the gas pipe.
- C. Roof Structure: Bond roof structure steel at its nearest accessible point to the building steel connection point with a 4/0 bare stranded copper conductor. Exothermic weld both connections.
- D. Domestic Water Meter: Install bond across water meter with 4/0 stranded bare copper conductors of sufficient length to accommodate removal of meter. Exothermic weld both connections to water pipe.
- E. Non-Metallic Domestic Water Insulated Coupling: Install bond across insulated coupling with 4/0 stranded bare copper of sufficient length to accommodate removal of coupling. Exothermic weld both connections to water pipe.
- F. Telephone Services: Separately bond both the telephone service and building telephone system ground buses (one for ATT and one for local telephone company) in telephone room to the building service ground bus in the main switchboard with one No. 6 bare stranded copper conductor. Provide 6 ft. slack at each telephone equipment backboard.
- G. Satellite Dish: Bond satellite dish ground to the building service ground bus in the main switchboard with a No. 6 bare stranded copper conductor. Provide 15' slack at satellite dish.
- H. Gas Meter: Install bond across gas heater with a No. 4/0 stranded bar and copper conductor of sufficient length to accommodate removal of meter. Use ground clamps on pipes and exothermic weld cable to clamps (where gas meter is provided).

#### 3.07 EQUIPMENT GROUNDING CONDUCTOR

- A. General: In addition to utilizing the metallic conduit and equipment enclosures as a continuous equipment grounding path, install a separate insulated copper conductor, color coded green, from respective switchboard or panelboard ground bus to controller and/or device.
- B. All steel conduits entering the main switch shall have a threaded conduit insulated type "BLG" grounding bushing bonded together and to the ground bus with a No. 4 bare stranded copper conductor.

#### 3.08 ADDITIONAL EQUIPMENT GROUNDING CONDUCTOR

- A. Rooftop HVAC Units: Install an equipment grounding conductor from the respective switchboard or panelboard ground bus to the unit disconnect switch and from disconnect switch to equipment ground lug or to housing in absence of ground lug.
- B. Install a separate copper equipment grounding conductor between the respective ground buses of the following:
  - 1. Service Switch - distribution panelboard - panelboard
  - 2. Service Switch - transformer
  - 3. Transformer - panelboard
  - 4. Panelboard - sub-panelboard
- C. Isolated Ground Receptacles: Install a separate grounding conductor for each circuit or group of circuits as indicated on the plans from panelboard isolated ground bus to isolated ground receptacle screw. Install a separate equipment grounding conductor for each circuit or group of circuits as indicated on the plans from panelboard ground bus to device box ground screw.

- D. Typical Wiring Devices: At both switches and receptacles, provide a grounding jumper from the grounding screw on the device box, to the grounding screw on the device (excluding the conditioned power, isolated ground branch circuits).

### 3.09 EQUIPMENT AND ISOLATED GROUNDING CONDUCTOR ROUTING

- A. Route equipment and isolated grounding conductor with respective feeder, power wiring and branch circuit conductors.

### 3.10 CONDUITS

- A. All grounding electrode conductors, equipment grounding conductors and bonds where not internal to equipment enclosures shall be installed in conduit to within 6" of terminating clamp and exothermic weld.

### 3.11 CODES AND RESTRICTIONS

- A. Where expressly forbidden by local authorities, conduit shall not be used as an equipment grounding conductor. Electrical contractor shall provide a copper equipment grounding conductor sized in accordance with NEC 250-95.
- B. Aluminum conductors and termination clamps shall not be used in the grounding system.

### 3.12 TESTING

#### A. Ground Resistance

1. Upon completion of the ground rod installation, the electrical contractor shall test the installation. Grounding resistance reading shall be taken before connection is made to the building cold water piping system. Ground resistance readings shall not be taken within forty-eight hours of rainfall.
2. If the resistance to ground exceeds 5 ohms, additional rods shall be driven and bonded together, until a reading of 5 ohms or less to ground is obtained. After completion of the grounding system, measure the system ground resistance with a "Megger Earth Tester". Submit directly to the Project Manager two (2) copies of each test report certified by the testing technician and the electrical contractor.

#### B. Neutral Current On Grounding Conductors

1. All grounding electrode conductors and ground bus shall be measured by the electrical contractor for objectionable levels of current and to detect any inadvertent connection of neutral to ground.
2. If the ground current exceeds 10% of the rating of the conductor ampacity, all devices on that feeder or circuit shall be rechecked for proper connection.

#### C. Connection

1. All grounding system connections shall be rechecked at final checkout for correct wiring termination methods and mechanical strength.

END OF SECTION

**PART 1 - GENERAL****1.01 SUMMARY**

- A. The work required under this section consists of lighting fixtures and lamps
- B. Related Work specified elsewhere includes but not limited to:
  - 1. Section 01010 - Furnished By Owner Items (FBO)
  - 2. Section 16121 - (FBO) Flexible Wiring Systems

**1.02 GENERAL**

- A. All lighting fixtures and lamps, together with required factory mounting hardware, accessories, and flexible wiring system (Sales and Receiving Areas only) shall be furnished by Home Depot, and installed by the electrical contractor, under this Section. Any additional non-factory related devices or accessories to support fixtures on ceiling or from building structure shall be provided by the electrical contractor.
- B. This does not include any aspect of the Fan Cloud Display system.
- C. Electrical contractor shall include in his price all labor and equipment rental necessary to completely install the lighting fixtures as indicated on the plans, and shall perform all warranty work required during the warranty period.
- D. All support channel, conduit, wireways, wire, couplings, connectors, clamps, support loops, jack chains, adapters, brackets, tube guards, and any other non-factory accessory required to install the lighting fixtures shall be provided by the electrical contractor.

**1.03 FBO PROCEDURES**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section. General requirements related to Furnished by Owner (FBO) Items are as defined in Section 01010. All FBO Forms listed below are included as part of Section 01010.

- B. Vendor Contact: Contractor shall send a completed "FBO Form A: Contractor Information Form" to the FBO vendor indicated below, twelve (12) weeks prior to the scheduled installation of the specified system:

Acuity Brands, Inc.  
1400 Lester Road  
Conyers, GA 30012  
Contact: Parker Slade  
email: TheHomeDepotTeam@AcuityBrands.com  
phone: (800) 545-6818

- C. Take-Offs: FBO Vendor shall provide "take-offs" to the Contractor as specified in Section 01010. The Contractor shall then verify this "take-off" using an "FBO Form B: Take Off Confirmation Sheet".
- D. Receipt Of Shipment: Contractor shall verify shipment per the requirements of Section 01010 and complete the "FBO Form C: Confirmation of Shipment" and submit back to the FBO vendor.
- E. Request for Changes: Changes to materials and quantities after receipt of shipment shall be coordinated by the contractor with the FBO vendor per the requirements of Section 01010 using an "FBO Form D: Request For Additional/Replacement Materials".
- F. Return Merchandise Authorization Policy: The Home Depot will add to the contractors' scope of work the responsibility for coordinating (1) customer accommodation return request through the FBO Vendor. Requests shall be submitted using the "FBO Form E: Returned Materials" as specified in Section 01010.
  - 1. Restocking charges will be assessed as follows:
    - a. All material shall be accepted on a freight allowed basis.
    - b. A restocking fee shall not be charged on surplus material returned with a total value of \$1,500.00 or less.
    - c. Surplus material to be returned in excess of \$1,500.00 may be subject to a 15% restocking charge.
    - d. Defective and damaged materials shall not be subject to restocking charges.
  - 2. Lithonia Lighting may limit returns to no more than 5% of the original order value of the store package.
  - 3. Lithonia Lighting will not be held responsible for defective fluorescent ballasts. If the contractor believes the fluorescent ballast to be defective, he shall contact the local representative of the appropriate ballast manufacturer. If difficulty is encountered with the ballast manufacturer in this process, the contractor shall contact Lighting Associates for assistance.

**PART 2 - PRODUCTS**

**2.01 MATERIALS**

- A. Home Depot will furnish all lighting fixtures shown and scheduled on the drawings. Fixtures shall:
1. Be complete with lamps of the type noted on schedule. Lamps shall be factory installed in all troffers. HID and strip fluorescent lamps shall be shipped separately in full cartons.
  2. Have factory accessories, metal parts, glassware, plastic diffusers, trims, etc.
  3. Have factory cords, hooks and connectors (where applicable) for integration into the flexible wiring system.
  4. Be free from scratches, cracks, and other defects; any items damaged during shipment, handling, or installation shall be replaced by the Lithonia Lighting without expense to Home Depot.
- B. Fluorescent lighting fixtures shall be provided with energy efficient ballasts, as manufactured by Advance, Universal, or Magna-Tek. The ballasts shall be approved by the lamp manufacturer, for use with energy saving fluorescent lamps. Ballast performance shall be matched to energy saving lamp and shall be certified by a nationally recognized independent testing laboratory with a United States Government Registered Certification Mark. Ballast case temperature shall not exceed 90 degrees C. Ballast shall be high power factor, UL listed, Class-P.
- C. Each lighting fixture shall have been tested and certified for proper operation by the fixture manufacturer for the type ceiling and mounting in which it is installed, and so labeled.
- D. Unless otherwise specified, all diffusers for fluorescent lighting fixtures shall be prismatic acrylic KSH K12 with a thickness of 0.125 inches, measured from the back side to the peak of the prism.
- E. Each HID lighting fixture shall have a high-power factor, regulated output ballast provided by the fixture manufacturer, pre-wired with a Bussman glass tube fuse holder and fuse on EACH primary hot lead.
- F. Fluorescent lamps shall be as specified on the plans. Lamps shall be suitable for operation with energy conserving ballast. Fluorescent lamps shall have a rated life of 20,000 hours at three (3) hours per start.
- G. Incandescent lamps shall be inside frosted (except where scheduled on the plans to be clear), extended service with a rated life of 2,500 hours. Reflector lamps (R and PAR) shall have the beam type as called for in the lighting fixture schedule, and shall have a rated life of 2,000 hours for the standard type and 4,000 hours for the "Quartz" or "Krypton" types. Quartz lamps shall be clear, with a rated life of 2,000 hours. All incandescent lamps, except the quartz tubes, shall be rated for 130 volt operation.
- H. HID lamps shall be operated through a ballast designed to lamp wattage and supply voltage indicated. HID lamps shall be of type for highest rated initial lumen output in each lamp category.
- I. All recessed light fixtures shall have thermal protection as required by article 410-65(c) of the NEC.

**PART 3 - EXECUTION****3.01 INSTALLATION**

- A. Each recessed lighting fixture shall have a trim to match the type of ceiling (exposed grid, metal panel, etc.) in which it is being installed, except where noted otherwise on the plans.
- B. Each lighting fixture recessed in a ceiling of any type shall have an appropriate frame-in kit for that ceiling type.
- C. Each lighting fixture recessed in a concrete wall shall have a junction box or wiring compartment provided inside the fixture housing. Provide conduit access into the fixture concealed.
- D. The electrical contractor shall confirm exact locations of all lighting fixtures by coordination with the plans.
- E. All lighting fixtures shall be supported from substantial structure. The fixtures shall be supported in a manner that will ensure the fixture weight being equally distributed from each supporting member so that the fixture remains in a level position. The electrical contractor shall install all lighting fixtures in accordance with any seismic codes and related supplementary requirements enforced by the local authorities having jurisdiction.
- F. Fluorescent fixtures installed recessed in a suspended ceiling system shall be supported from substantial structure with two (2) 12 gauge wires on diagonal corners of the fixture. In addition, the fixture shall be clipped to the supporting grid of the ceiling system.
- G. Fluorescent fixtures installed on any ceiling other than a suspended ceiling system (specifically mentioned above) shall be attached to the wood, steel, or concrete structural system to which the finished ceiling material is attached. Provide a minimum of two (2) supports for each 4' or 8' fixture chassis.
- H. For surface-mounted fixtures installed on solid ceilings (such as the restrooms, vault and counting rooms) the electrical contractor shall provide conventional wiring and flexible conduit from the fixture to a modular wiring conversion junction box above the ceiling.

- I. All fixtures with lamp position, tilt, shutters, rotation, or other types of adjustment shall be rough adjusted by the electrical contractor at the time of installation. The engineer or Home Depot representative will determine the final aiming and adjustments during the final review. Fixtures serving areas where day lighting is predominant shall be adjusted after sunset.
- J. Where a continuous row of fluorescent fixtures is shown, the letter shall indicate the type. Provide the number of fixtures or total length shown in each row. All HID, fluorescent, or incandescent light fixtures in the same general area shall be the same type unless otherwise indicated.
- K. Install the type and number of lamps specified at each lighting fixture. All fixtures shall be illuminated at the time of final review.
- L. Wherever possible, plug-in type connectors shall be used for continuous rows of fluorescent lighting. Plug-ins shall be factory installed and wired with keyed plugs to prevent derangement of phase conductors. This plug system shall be internal to the continuous fixture housing and shall not be a part of a modular wiring system.
- M. HID lighting fixtures suspended from structure shall have safety chains attached from ballast (and reflector where not rigidly attached) to supporting steel.
- N. Loops or "eye-bolts" attached to the supporting steel for HID fixture hooks shall be provided by the electrical contractor. Loops shall be fully closed  $\frac{3}{8}$ " diameter galvanized steel. Loop shall be not less than  $1\frac{1}{2}$ " inside diameter.
- O. Hooks for supports of HID lighting fixtures shall have a loop seat that is specifically designed to prevent swiveling or misalignment of fixtures.
- P. Provide steel support channel or conduit, as indicated, for hanging fluorescent and HID lighting fixtures. Support shall be attached to structure as indicated on the plans with clamps as required. **DO NOT PENETRATE THE ROOF DECK FOR THE PURPOSE OF SUPPORTING LIGHTING FIXTURES OR ANY ASSOCIATED EQUIPMENT.**
- Q. Chain or cable hung fluorescent fixtures shall have extension "jack" chains as required to mount the fixtures to a height above the finished floor as noted on the plans. Brace chains shall be added to prevent fixtures from swaying.
- R. Parking area lighting fixtures shall be supported on round tapered steel poles, unless otherwise indicated. Poles shall be installed on contractor provided concrete bases as indicated on the plans.
- S. Concrete bases for steel poles shall be 30" from the top of the base to the finished parking surface when in open parking areas.
- T. In landscaped areas, concrete bases for steel poles shall be installed 4" from the top of the base to the finished grade. Poles shall not be located within 30" of the inside edge of the curb to prevent impact by vehicles. Where adequate space does not exist for 30" separation, provide 30" high bases as indicated in paragraph (S) above.
- U. Concrete for steel pole bases shall be 3000 PSI with reinforcement and bolt pattern per the detail found on the drawings.
- V. The Electrical Contractor shall provide an alternate price (to be included with the base bid) for the installation of reinforced pre-cast concrete poles, in lieu of steel poles on concrete bases.
- W. In general, pre-cast concrete poles shall be installed direct into the grade a minimum of 10% +2 feet of the overall pole height. Final mounting height shall be as indicated on the plans, measured from the bottom of the parking area fixture to the finished parking surface. Backfill, compaction, supplementary reinforcement and supports beneath and around concrete poles shall be provided per the direction of the Structural Engineer of record in conjunction with the manufacturers construction data and specifications. Submit to the Architect six (6) sets of the manufacturer's engineering data for the specified poles to be installed. The Structural Engineer will issue a typical installation detail to be returned with the approved manufacturer's data to the Electrical Contractor.

END OF SECTION

**Construction Specification (FBO) EMERGENCY ELECTRICAL GENERATING SYSTEM (NIXON-KOHLER)****PART 1 - GENERAL****1.01 SUMMARY**

- A. Section Includes: This specification includes requirements for providing a factory built, prototype tested, production tested, field tested, complete and operable standby emergency electric generating system, including all devices and equipment specified herein, shown on the drawings, and as required for the service. The intent of this specification is to provide equipment of proven reliability and compatibility.
- B. Related Sections: Related work specified elsewhere includes but may not be limited to:
  - 1. Section 01010 - Furnished By Owner Items (FBO)
  - 2. Section 01300 - Submittals
  - 3. Section 16010 - Basic Electrical Requirements
  - 4. Section 16625 - Automatic Load Transfer Switches

**1.02 REFERENCES**

- A. Industry standards and specifications:
  - 1. NFPA 110 - Standard for Emergency and Standby Power Systems
  - 2. SAE J1349
  - 3. International Building Code

**1.03 SYSTEM DESCRIPTION**

- A. The emergency electric generating system described herein, including the engine-generator set, shall be factory built, factory tested, and shipped by the supplier. The supplier shall be the sole source of supply and responsibility for warranty, parts, and service. The supplier shall have a local representative and shall provide factory trained servicemen, required stock of replacement parts, and technical assistance. Each set shall be rated for kW, KVA at 0.8 PF, 60 Hz, phase, wire, and volts on a standby basis as shown on the drawings.
- B. The electric generating system shall meet all requirements of the latest issue of NFPA 110 including design specifications, prototype test, one-step full-load pickup, and installation acceptance. The responsibility for performance to this specification rests solely on the supplier of the entire system and shall not be split up among individual suppliers of components comprising the system.

**1.04 FBO PROCEDURES**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section. General requirements related to Furnished by Owner (FBO) Items are as defined in Section 01010. All FBO Forms listed below are included as part of Section 01010.
- B. Vendor Contact: Contractor shall send a completed "FBO Form A: Contractor Information Form" to the FBO vendor indicated below, twelve (12) weeks prior to the scheduled installation of the specified system:

Mark Tyler  
 Major Accounts Manager  
 Nixon Power Services  
 5901 Goshen Springs Road  
 Norcross, GA 30071  
 Phone: (800) 596-4966 ext. 2634  
 Fax: (770) 448-6535  
 E-mail: mtyler@nixonpower.com  
 Exesite address: homedepot@nixonpower.com

**Technical Contact:**  
 Kathryn Thompson  
 Engineering Account Manager  
 Nixon Power Services  
 5901 Goshen Springs Road  
 Norcross, GA 30071  
 Phone: (800) 586-4966 ext. 2498. After hours: (404) 683-9297  
 Fax: (770) 448-6535  
 E-mail: kthompson@nixonpower.com  
 Exesite address: homedepot@nixonpower.com

- C. Take-Offs: FBO Vendor shall provide "take-offs" to the Contractor as specified in Section 01010. The Contractor shall then verify this "take-off" using an "FBO Form B: Take-Off Confirmation Sheet".

**Construction Specification (FBO) EMERGENCY ELECTRICAL GENERATING SYSTEM (NIXON-KOHLER)**

- D. Receipt of Shipment: Contractor shall verify shipment per the requirements of Section 01010 and complete the "FBO Form C: Confirmation of Shipment" and submit back to the FBO vendor.
- E. Request for Changes: Changes to materials and quantities after receipt of shipment shall be coordinated by the contractor with the FBO vendor per the requirements of Section 01010 using an "FBO Form D: Request For Additional/Replacement Materials"
- F. Return Merchandise Authorization Policy: The Home Depot will add to the contractors' scope of work the responsibility for coordinating (1) customer accommodation return request through the FBO Vendor. Requests shall be submitted using the "FBO Form E: Returned Materials" as specified in Section 01010.

**1.05 SUBMITTALS TO CONTRACTOR**

- A. Product Data: The supplier shall furnish complete system schematic wiring diagrams for the engine-generator set. The manufacturer shall have printed literature and brochures describing the standard series specified (not a one of a kind fabrication). Unless specified otherwise herein, all performance and other information shall be as on the manufacturer's printed literature.
- B. Bidding: Review all bid documents for compliance with the requirements of this specification. All discrepancies shall be brought to the attention of the Architect prior to bid time. Any discrepancies not noted before bid shall be the responsibility of the contractor. Contractor shall include in his price all labor and equipment rental necessary to completely install the generator and fuel system as indicated on the plans, and perform all warranty work required during the warranty period.
- C. Shop Drawings: Shop drawing submittals shall be prepared by the supplier based on the contract drawings and as specified herein in accordance with Section 01300 requirements. Standard and typical drawings will not be accepted.
- D. Quality Control Submittals:
  - 1. Design Data: Calculations shall be submitted to demonstrate that the exciter and voltage regulator will permit utilization of at least 80% of maximum available prime mover torque at all engine speeds between 50% and rated speed, and with rated unity power factor load connected to its terminals.
  - 2. Test Reports: Performance information shall be the result of test procedures in accordance with nationally recognized standards, plus such other procedures that are judged necessary by the manufacturer to insure maximum service reliability for emergency systems. A summary of this information shall be submitted.

**1.06 RESPONSIBILITIES**

- A. Provision of Engine-Generator Set:
  - 1. Furnished By Owner (FBO): The generator shall be supplied by the Owner, installed by the contractor. Submittals, acceptance at site, storage and protection, changes to materials, etc. shall be in accordance with Section 01160 requirements. Refer to drawing for emergency electrical generating system supplier National Account Representative. Manufacturer is solely responsible for correctness of shipped materials and quantities.
    - a. Electrical contractor shall contact emergency electric generating system supplier in accordance with Section 01160, except electrical contractor shall contact emergency electric generating system supplier eight (8) weeks prior to scheduled installation.
    - b. The engine-generator set, together with all required factory hardware, accessories, flexible fuel line(s), muffler, exhaust line, weather protective housing, solenoid(s), valves, pressure regulator(s), fuel strainer(s), battery, engine jacket heater, battery charger, remote alarm annunciator panel, etc., shall be furnished by Owner.
- B. Electrical contractor shall provide control conductors between generator accessories and the EMS panel as shown on the drawings.
- C. Any additional non-factory related devices or accessories such as the concrete pad, security fences and gates, screen walls, anchor bolts, remote fuel tank(s), rigid gas line(s), remote annunciator panel circuits, engine jacket heater circuits, battery charger circuits, ATS circuits, ground rod, ground rod clamp, grounding electrode conductor, etc. shall be furnished and installed by the contractor. All conduits, wireways, wire, couplings, connectors, clamps, adapter or any other non-factory related electrical accessories shall be furnished and installed by the contractor.

**1.07 PROJECT/SITE CONDITIONS**

- A. Installer shall examine the substrates and conditions under which materials are to be installed, and notify the architect in writing of conditions detrimental to the completion of the work. Work shall not proceed until unsatisfactory conditions have been corrected.

**1.08 SEQUENCING AND SCHEDULING**

- A. Installation/Testing: The complete Emergency Electrical Generating System shall be installed and ready for testing per this specification 2 weeks prior to store Turnover date.

**Construction Specification (FBO) EMERGENCY ELECTRICAL GENERATING SYSTEM (NIXON-KOHLER)****1.09 WARRANTY**

- A. The complete standby electric power system, including 1800 RPM engine-generator set equipped with set exerciser, and running time meter, shall be warranted for a period of five (5) years or fifteen hundred (1,500) operating hours, whichever occurs first, from the Grand Opening date. Multiple warranties for individual components (engine, generator, controls, etc.) will not be acceptable. Satisfactory warranty documents shall be submitted. This warranty shall be detailed in available written documents.

**PART 2 - PRODUCTS****2.01 MANUFACTURER**

- A. This system shall include one Kohler engine-generator set as represented in the published specifications for that model. All controls shall be the standard of the manufacturer, who shall be engaged in the manufacture of engine-generator sets, transfer switches, and accessories and shall have them available for sale on the open market. Control parts shall be identified by part numbers of this manufacturer and shall have second source listing where applicable. Control systems that are supplied by a sub-vendor or subcontractor of the vendor and not incorporated within the documentation drawings of the engine-generator manufacturer are not acceptable.

**2.02 MANUFACTURED UNITS**

- A. The generator shall include a combination engine-generator set, cooling fan, radiator, mounting rails, weather-protective housing, muffler, output circuit breaker(s), unit-mounted controls, and such other components, accessories, parts, tests, documents, and services required to comply with this specification.
- B. Engine: Each engine-generator set shall be mounted on a heavy duty steel base to maintain proper alignment between components, and each set shall incorporate vibration isolators of the type and quantity as specified by the set manufacturer. Engine shall be stationary, liquid-cooled, spark ignited for fuel as specified below. Engine shall be capable of driving the generator of this rating on a continuous standby basis for the duration of normal source interruptions per SAE J1349 conditions. Stand-by ratings shall be as shown on the drawings. Contractor shall be responsible for field coordination of gas pipe size, length, pressure requirements and point of termination. Engine components shall include the following:
  - 1. A 12 volt DC, solenoid shift, electric starter(s) as required by manufacturer.
  - 2. Positive displacement, mechanical full pressures lubrication oil pump, full flow lubrication oil filter with replaceable element, pressure relief valve, dipstick oil level indicator and oil drain valve with hose extension.
  - 3. Dry element air cleaner with replaceable element.
  - 4. Engine speed electronic governing system to control generator frequency to within 0.25% of rated frequency under steady state load conditions, and capable of parallel operation with load sharing controls.
  - 5. Engine mounted thermostatically controlled water jacket heater to aid in quick starting. Heater shall be rated single-phase, 1500 watts and be disconnected whenever the engine starts. Contractor shall provide proper circuit from normal utility power source.
  - 6. Engine protection devices shall have sensing elements located on the engine to initiate the following alarms and engine shutdowns:
    - a. Low coolant temperature alarm
    - b. Low lubrication oil pressure alarm
    - c. High coolant temperature alarm
    - d. Low lubrication oil pressure shutdown with indication
    - e. High coolant temperature shutdown with indication
    - f. Overspeed shutdown with indication
    - g. Overcrank lockout with indication
    - h. Low coolant shutdown that shall activate high engine temperature lamp and shutdown.
    - i. Engine starter battery charging alternator, with solid-state voltage regulator.
- C. Engine cooling system: Engine shall be radiator cooled by engine mounted radiator system including belt-driven pusher fan, coolant pump, and thermostat temperature control. Performance of components shall be as required by the manufacturer. The generator equipment supplier shall furnish and install 50% ethylene glycol antifreeze solution to fill engine cooling system at start-up.
- D. Engine exhaust system: Exhaust muffler shall be furnished for each engine of size as recommended by manufacturer. Muffler shall be of the critical type. Muffler shall be mounted within the protective housing and its weight shall not be supported by the engine. Galvanized steel tail pipe and rain cap shall be furnished by the supplier. Flexible exhaust connection shall be furnished as required for connection between engine exhaust manifold and exhaust line. All exhaust system components shall be properly sized to assure proper operation without excessive back pressure when installed. Make provisions as required for pipe expansion and contraction.
- E. Engine fuel system: Contractor shall provide all rigid fuel system piping sized for proper fuel flow to the engine. Provide all supply lines, pressure regulators, fuel strainers, cut-offs, solenoid valves, vacuum lines, etc., along with all necessary fittings. Provide all connections for fuel system to engine in compliance with applicable codes and regulations. Reference drawing for correct fuel source. When provided, fuel tank shall be securely bolted in place per



**Construction Specification (FBO) EMERGENCY ELECTRICAL GENERATING SYSTEM (NIXON-KOHLER)**

recommendations. Fuel storage tanks and related accessories shall be new. A low fuel supply sensing device shall be furnished by the Owner and installed by the contractor on the line side of the primary regulator. The sensing device shall be adjustable to signal a low fuel level when the tank contains less than a two (2) hour supply based on consumption rate of generator specified.

1. **LPG System:** The contractor shall coordinate the fuel tank size and its associated piping with the mechanical contractor and the generator and fuel system supplier. Contractor shall provide an LPG fuel storage tank on pad together with all necessary lines and fittings to provide a complete and operable system. A mechanically governed (vacuum) auxiliary fuel lift and liquid withdrawal system shall be provided in cold climate installations in lieu of larger tanks designed for additional vaporization area. The contractor shall coordinate this with the generator supplier to ensure that the correct fuel set-up is furnished.
  2. **Natural Gas System:** The contractor shall coordinate the fuel line size with the mechanical contractor and the generator supplier.
  3. **Diesel System:** Contractor shall provide an on-board diesel fuel storage tank together with all necessary lines and fittings to provide a complete and operable system. Minimum required fuel capacity is specified in drawings. Tank is supplied in accordance with federal EPA regulations – any local requirements must be specified in the job specific documents. Any additional requirements will be addressed as a request for additional work and will proceed after issue of a change-order. No permitting of fuel storage systems is included in the generator equipment supplier's scope of work.
- F. **Generator:** Generator shall be single-bearing, self-aligning, four-pole, synchronous type, evolving field, with amortisseur windings, direct drive centrifugal blower for proper cooling and minimum noise, temperature compensated solid-state voltage regulator and brushless rotating rectifier exciter system. Brushes will not be accepted. Generator shall be directly connected to engine flywheel housing and driven through a flexible coupling to insure permanent alignment. Gear driven generators are not acceptable under this specification. Insulation shall meet Class F NEMA standards. The maximum temperature rise shall not exceed 130°C at 40°C ambient. Generator design shall prevent potentially damaging shaft currents. Generator design shall be of the self-protecting type, as demonstrated by the prototype short-circuit test. The generator, exciter, and voltage regulator shall be designed and manufactured by the engine-generator set manufacturer so that the characteristics shall be matched to the torque curve of the prime mover.
1. **Leads:** The three-phase, broad range, reconnectable generator shall have 12 leads brought out to allow connection by user to obtain any of the available voltages for the unit.
  2. **Voltage Regulator:** Voltage regulator shall be solid-state design and shall function by controlling the exciter magnetic field between stator and rotor to provide no load to full load regulation of rated voltage within 1% during steady-state conditions. The engine-generator set and regulator must sustain at least 90% of no load voltage for ten (10) seconds with 300% of rated load at near zero power factor connected to its terminals. The voltage regulator shall be of an asynchronous pulse width modulated design that is insensitive to severe load induced waveshape distortion from SCR or thyristor circuits such as those used in battery charging (UPS) and motor speed control equipment. A rheostat shall provide a minimum of 5% voltage adjustment from rated value.
  3. **Exciter:** Exciter shall be three-phase, full-wave, rectified, with heavy-duty silicon diodes mounted on the common rotor shaft and sized for maximum motor starting loads.
- G. **Engine-generator set controls:** Provide a lighted, unit mounted control module that is factory built, wired, tested, and shock-mounted by the manufacturer. Engine-generator set control shall include the following:
1. **Indicators:** oil pressure gauge, coolant temperature gauge, charge rate volt ammeter and running time meter.
  2. **Manual selector switch:** RUN-OFF/RESET-AUTO.
  3. **Remote, two-wire controls** start-up terminals.
  4. **Manual reset** field circuit breaker.
  5. **Automatic engine shutdown** for the following fault conditions:
    - a. Overcrank
    - b. Overspeed
    - c. Low oil pressure
    - d. High engine temperature
  6. **Indicator lamps** shall be furnished by the supplier and installed by the contractor to signal the following functions:
    - a. SYSTEM READY - indicates system is in "AUTO" mode.
    - b. PRE LOW OIL PRESSURE - indicates oil pressure is marginally low.
    - c. PRE HIGH ENGINE TEMPERATURE – indicates engine temperature is marginally high.
    - d. LOW OIL PRESSURE - indicates engine has shutdown because of critically low oil pressure.
    - e. HIGH ENGINE TEMPERATURE - indicates engine has shut down because of critically high temperature.
    - f. OVERSPEED - indicates engine has shut down because of excessive rpm.
    - g. OVERCRANK - indicates the starter has been locked out because cranking time was excessive.
    - h. LOW ENGINE TEMPERATURE – indicates engine temperature is marginally low for starting.
    - i. LOW FUEL - indicates fuel supply is sufficient for only 2.5 hours run time at full load.
    - j. GENERATOR NOT IN AUTO – indicates control switch is not in the "AUTO" position.
    - k. Provide two additional fault condition lamps to be designated by the engineer.
  7. **A fault reset switch** shall be furnished to clear fault indications and allow restarting of the engine after shut down faults. The control design shall be such that the fault indication shall remain on until reset. The fault indicator memory shall not be dependent on the presence of either AC or DC voltage and shall retain the fault status memory even through complete removal and replacement of the starting batteries. The fault reset function shall operate only when the RUN-OFF/RESET-AUTO switch is in the OFF/RESET position.

**Construction Specification (FBO) EMERGENCY ELECTRICAL GENERATING SYSTEM (NIXON-KOHLER)**

8. A locking screwdriver type potentiometer to adjust the voltage to within 5% of the rated value.
9. Manual reset exciter field circuit breaker.
10. A built-in 5 minute cool-down time delay.
11. A locking screwdriver type potentiometer to adjust the speed to within 2 RPM of rated value.
12. Indicating AC voltmeter, digital or analog (90-degree scale, 2 1/2" flange, 2% switchboard meter).
13. Indicating AC ammeter, digital or analog (90-degree scale, 2 1/2" flange, 2% switchboard meter).
14. Indicating Frequency meter digital or analog (45-65 Hz., 90-degree scale, 2 1/2" flange, and +0.6 Hz panel meter).
15. Four position AC meter phase selector switch with "off" position to read line current and voltage in each phase.

**2.03 EQUIPMENT**

- A. Starting Battery: A starting battery shall be furnished for each engine and shall be mounted in a battery rack within the engine-generator set skid base.
- B. Battery Charger: A voltage regulated, 12 Volt battery charger shall be furnished for the engine-generator set. The charger power shall be supplied from the normal source. Contractor shall provide circuits as required.
- C. Vibration Isolators: Each engine-generator set shall be mounted on vibration isolators internal to the set skid base.
- D. Remote Audible Annunciator: Provide remote audible annunciator for engine-generator set with minimum indication as follows:
  1. Utility power
  2. Emergency power supply
  3. Generator fault
- E. Weather Protective Housing: A weather-protective housing with access panels and ventilation openings shall be provided.
- F. Relay Kits: The following accessories, which will be used by the EMS panel to monitor the generator, shall be provided.
  1. Run Relay Kit, Kohler #273743
  2. Common Fault Relay Kit, Kohler #273914
- G. Seismic Vibration Isolators: Seismic Vibration Isolators shall be provided only when required by local code, or when generator is to be installed in a seismic risk zone.
- H. UL2200 Label: A label indications approval of generator to Underwriters Laboratory (UL) requirements shall be provided.
- I. Skid Endcaps: Provide skid endcaps to protect radiator from damage.
- J. Emission Canisters: Emission Canisters shall be provided only where required by local code.

**2.04 SOURCE QUALITY CONTROL**

- A. Tests: In order to have met the requirements of this specification, four separate series of tests shall have been performed: Factory Prototype Model Tests, Factory Production Model Tests, Initial Start-Up and System Check-Out Test, and Installation Acceptance Tests.
  1. Factory Prototype Model Tests: The electric generating system consisting of prime mover, generator, governor, coupling and all controls shall have been tested as a complete unit on a representative engineering prototype model as required by NFPA 110. The tests, being potentially damaging to the equipment tested, shall not be performed on equipment to be sold, but on separate prototype models as specified by NFPA 110, paragraph 3-2.1 thru 3-2.1.2 and their accomplishments certified by means of documentation of the tests accompanying submittal data.
  2. Factory Production Model Tests: Before shipment of the equipment, the engine-generator set shall be tested under rated load and power factor for performance and proper functioning of control and interfacing circuits. An engineer shall certify these tests and a summary of the results shall be submitted. Tests shall include:
    - a. Single step load pickup per NFPA 110, paragraph 5-13.2.6.
    - b. Transient and voltage dip responses and steady state voltage and speed (frequency) checks.
    - c. Fuel consumption (No load, 1/4, 1/2, 1/3, and Full load).
    - d. Generator temperature rise by resistance method.
  3. Initial Start-Up and System Check-Out Test: The complete installation shall be initially started-up and checked out for operational compliance by a factory-trained representative of the manufacturer.
  4. Installation Acceptance Tests - Upon successful completion of initial start-up and system check-out, the supplier shall perform Installation Acceptance testing. The Engineer shall be notified one week in advance of the test.

**PART 3 - EXECUTION****3.01 INSTALLATION**

- A. Install emergency generator in accordance with approved shop drawings and applicable codes and standards. Coordinate provisions for installation with work of other trades. Connect all power and control circuits, silencer, fuel system and batteries. Connect generator and automatic load transfer switch to building electrical distribution system as

**Construction Specification (FBO) EMERGENCY ELECTRICAL GENERATING SYSTEM (NIXON-KOHLER)**

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shown on drawings. Provide initial filling of fuel tank and all fluids prior to start-up test. After successful conclusion of start-up test, provide full tank of fuel and top off all fluid levels for turn-over to Owner.

**3.02 CLEANING**

- A. At completion of work, touch up minor damage to pre-finished surfaces to the satisfaction of the Architect. Replace materials damaged or stained during installation.

**END OF SECTION**

**Construction Specification****(FBO) AUTOMATIC LOAD TRANSFER (NIXON-KOHLER)****PART 1 - GENERAL****1.01 SCOPE**

- A. Furnish and install the low voltage automatic transfer switches having the ratings, features/accessories and enclosures as specified herein and as shown on the contract drawings.
- B. Related Work specified elsewhere includes but not limited to:
  - 1. Section 01010 - Furnished By Owner Items (FBO)
  - 2. Section 16010 - Basic Electrical Requirements
  - 3. Section 16620 - Emergency Electrical Generating System

**1.02 GENERAL**

- A. The automatic transfer switch together with all required factory hardware, accessories, indicators, enclosures, lugs, controls, etc., shall be supplied by Home Depot, and installed by the electrical contractor, under this Section.
- B. The automatic transfer switch includes NEMA-1 enclosure, solid state logic control board, all on supervisory relays, test switch, indicating LED's, override switch, timers, area protection panel, high speed operating mechanism, and time delay relays. The generator and remote annunciator is specified under another section.
- C. Any additional non-factory related devices or accessories such as the mounting hardware, support channel, external cabinet conduit, boxes, connectors, couplings, interface wiring between the remote annunciator panel, generator control panel, line power circuits, internal wiring between accessory relays, etc., shall be provided and installed by the electrical contractor.
- D. Electrical contractor shall include in his price, all labor and equipment rental necessary to completely install the automatic transfer switch as indicated on the plans.
- E. All conduits, wireways, wire, couplings, connectors, clamps, adapter or any other non-factory related electrical accessories shall be provided and installed by the electrical contractor.

**1.03 FBO PROCEDURES**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section. General requirements related to Furnished by Owner (FBO) Items are as defined in Section 01010. All FBO Forms listed below are included as part of Section 01010.
- B. Vendor Contact: Contractor shall send a completed "FBO Form A: Contractor Information Form" to the FBO vendor indicated below, twelve (12) weeks prior to the scheduled installation of the specified system:

Mark Tyler  
 Major Accounts Manager  
 Nixon Power Services  
 5901 Goshen Springs Road  
 Norcross, GA 30071  
 Phone: (800) 596-4966 ext. 2634  
 Fax: (770) 448-6535  
 E-mail: mtyler@nixonpower.com  
 Exesite address: homedepot@nixonpower.com

**Technical Contact:**  
 Kathryn Thompson  
 Engineering Account Manager  
 Nixon Power Services  
 5901 Goshen Springs Road  
 Norcross, GA 30071  
 Phone: (800) 586-4966 ext. 2498. After hours: (404) 683-9297  
 Fax: (770) 448-6535  
 E-mail: kthompson@nixonpower.com  
 Exesite address: homedepot@nixonpower.com

- C. Take-Offs: FBO Vendor shall provide "take-offs" to the Contractor as specified in Section 01010. The Contractor shall then verify this "take-off" using an "FBO Form B: Take-Off Confirmation Sheet".
- D. Receipt of Shipment: Contractor shall verify shipment per the requirements of Section 01010 and complete the "FBO Form C: Confirmation of Shipment" and submit back to the FBO vendor.

**Construction Specification****(FBO) AUTOMATIC LOAD TRANSFER (NIXON-KOHLER)**

- E. Request for Changes: Changes to materials and quantities after receipt of shipment shall be coordinated by the contractor with the FBO vendor per the requirements of Section 01010 using an "FBO Form D: Request For Additional/Replacement Materials"
- F. Return Merchandise Authorization Policy: The Home Depot will add to the contractors' scope of work the responsibility for coordinating (1) customer accommodation return request through the FBO Vendor. Requests shall be submitted using the "FBO Form E: Returned Materials" as specified in Section 01010.

**1.04 SYSTEM DEFINITION**

- A. The transfer switch shall be designed, built, tested, furnished and warranted by the manufacturer of the standby, standby continuous or prime power generating equipment to ensure one source of responsibility and equipment compatibility. Transfer switch manufacturer shall have been regularly engaged in the production of U.L. (Underwriters Laboratory) Standard 1008 transfer switches. The transfer switch shall be documented, and have been offered for sale on the open market for a minimum of five (5) years. The manufacturer shall provide factory trained parts and service support through a factory authorized distributor that is regularly doing business in the area of the installation.
- B. The manufacturer shall supply literature containing diagrams, parts lists and descriptions sufficient for the owner's personnel, or subcontract supplier to install, operate and perform normal maintenance on the equipment.
- C. The automatic transfer switch shall be as indicated on the plans.

**PART 2 - PRODUCTS****2.01 CONSTRUCTION**

- A. The electrical operating means shall be one (1) operating coils rated for continuous operation, and both mechanically and electrically interlocked to provide positive, electrically guided action from normal to standby position. Maximum transfer time in either direction shall be six (6) cycles. Transfer switch shall not contain any integral overcurrent devices in the main power circuit, including molded case circuit breakers or fuses.
- B. The main switch contacts shall be double-break design, solid silver cadmium oxide to resist burning and pitting and for long life operation. Contact pressure shall be maintained by coil springs not subject to weakening or distortion as part of the current path. Switch shall have individual heat resistance contact chambers to prevent cross-arcing.
- C. Transfer switch shall have one (1) S.P.D.T. (Single Pole Double Throw), rated 10A at 600 volts auxiliary switch on both the normal and emergency sides, operated by the transfer switch. These auxiliary switches may be used to monitor transfer switch position using indicator lamps or for controlling other peripheral equipment.
- D. Provide auxiliary relay(s) controlled by the auxiliary switch, to provide additional contact(s) for control of additional peripheral equipment where shown on the drawings.
- E. Complete AL-CU (Aluminum-Copper) lugs, U.L. Listed and CSA Certified, shall be provided for both normal and emergency load positions. Wiring space at normal, emergency, and load lugs inside the transfer switch cabinet shall comply with NEC Table 373-6 (b). Full rated neutral bar with lugs for normal, emergency, and load neutral conductors shall be provided inside the cabinet.
- F. Unless noted or specified otherwise, transfer switch shall be mounted in a separate welded steel NEMA-1 cabinet, with a keyedlock on the door and with knockouts for conduit entry.

**2.02 CONTROLS**

- A. Control items (other than meters, switches, and indicating lamps) shall be mounted inside of the cabinet to prevent access by unauthorized personnel, but located to facilitate servicing.
- B. Control circuit disconnect plugs shall be provided to de-energize control circuits to avoid the hazards of electrical shock to personnel while making adjustments.
- C. The control shall be a printed circuit board with relay sockets for control functions. The line side phase loss relays shall be conventional plug-in industrial control electro-mechanical relays. The generator side control relay shall be a voltage sensitive electro-mechanical relay with a pickup rating designed to ensure rated voltage is available before transfer is initiated. Time delay features shall be implemented by adding plug-in solid-state timing relays to the pre-wired printed circuit board sockets and removing terminal strip jumper wires.
- D. Under voltage line side sensing shall be (3) phase, plug-in type adjustable solid-state close differential voltage sensitive relays to pre-wired printed circuit board sockets. Pickup and dropout point adjustments shall be:
- E. Three phase - pickup 78% to 111% - dropout fixed at 8% below selected pick-up point.
- F. Controls shall signal the engine-generator set to start upon a signal from the normal source voltage sensor(s). An instantaneous pick-up relay shall be provided to force the generator to enter the emergency start-up cycle without delay.

- G. After the normal voltage sensor(s) have locked into an emergency cycle, the load shall be transferred after the engine-generator set reaches approximately 90% of proper voltage. A solid-state time delay transfer relay shall be provided, adjustable from 0.3 to 30 seconds (factory set at 2 seconds), shall allow the engine-generator set to stabilize before application of the load.
- H. A solid-state time delay retransfer, adjustable from 2 to 30 minutes (factory set at 15 minutes), shall allow normal power to stabilize before retransfer and allow H.I.D.'s to recover before quartz lighting is disconnected.
- I. The operating power for transfer and retransfer shall be obtained from the source to which the load is being transferred. Controls shall provide an automatic transfer of the load from the emergency to the normal source if the emergency source fails when the normal source is available.
- J. Selector and Test switches shall be provided inside the cabinet to provide the following positions and functions:
  - 1. Selector Switch: STOP - Momentary position, stops operation of the transfer switch.
  - 2. Test Switch: TEST - Simulates a normal power loss to control unit for testing of an engine-generator set, including transfer of load.
- K. Where shown on the drawings or specified herein, the transfer switch shall be equipped with indicator lamps as follows:
  - 1. Indicator lamps shall be provided to indicate "NORMAL" and "EMERGENCY" transfer switch positions.
- L. Transfer switch shall have an Exerciser Clock to set day-of-week (one week dial minimum), time-of-day, and duration-of-time of engine-generator set(s) exercise period. A selector switch shall be included and set to "Simulate Power Failure" or "Test Engine Only".

### PART 3 - EXECUTION

#### 3.01 TESTING

- A. To provide proven reliability of the system, transfer switch shall be completely tested as follows:
  - 1. Representative production samples of the transfer switch supplied, shall be demonstrable, through tests, the ability to withstand at least 10,000 mechanical operating cycles. An operating cycle shall consist of one (1) electrically operated transfer from normal to emergency and back to normal.
  - 2. Transfer switch supplied shall be U.L. Listed per Standard 1008. The minimum WCR (Withstand and Closing Ratings) shall meet the requirements of U.L. Standard 1008 and shall be obtained without contact welding. Where the line side overcurrent protection is provided by fuses at 600 volts AC or less, the short circuit rating shall match that value as indicated on the plans.
- B. The RMS (Root Mean Square) symmetrical fault current ratings shall be verified by U.L. witnessed tests on representative test samples. All WCR test shall be performed with the overcurrent protective devices located external to the transfer switch. Test conducted with overcurrent protective devices internal to the transfer switch, in such a manner that the transfer switch interrupts the current rather than withstanding the current, are not acceptable under this definition of withstand.
- C. Production Model Tests and Field Tests: Perform these tests as described under "Factory Production Model Tests" and "Field Tests After Installation" under the "GENERAL" section individual engine- generator set "Sample Guide Specifications". A manufactures representative shall conduct a complete system operational test at the job site for the Specifying Engineer and for the owners operating personnel.

#### 3.02 RATINGS

- A. Transfer switches supplied shall be rated for all classes of load, both inductive and non-inductive at 600 volts and 250 volts tungsten lamp loads. No load diversification shall be allowed. Transfer switch shall be 60 Hz with solid neutral. Refer to drawings for the location of transfer switch . Transfer switch that must be derated when installed in an enclosure (if to the integral overcurrent device does not meet this specification). Transfer switches shall be rated for continuous operation in ambient temperatures of -18 degrees C (0 degree F) to 55 degrees C (130 degrees F).

### END OF SECTION

**PART 1 - GENERAL****1.01 SUMMARY**

- A. The Contractor shall provide a complete telephone raceway system as shown on the plans and herein specified and shall leave the same in readiness for wiring by others.

**PART 2 - PRODUCTS****2.01 MATERIALS**

- A. Provide a plastic pull line (rated at 500 lbs. test) in all conduits for telephone equipment installer's use. Ends of conduits shall be capped.
- B. Telephone Service Entrance Conduit: Supply and install service entrance conduits as shown on the plans and hereinafter specified.
  - 1. A #12 steel wire or plastic equivalent shall be installed in entrance conduits.
  - 2. Provide and install as indicated in section specifications 16450, all telephone equipment grounds.
  - 3. All underground entrances shall have metallic sleeves through building foundation walls and extend to undisturbed ground to avoid shear, and shall be hot-dipped galvanized steel conduit.
  - 4. All 90 degree bends shall be galvanized rigid steel conduit with a radius of not less than 10 times the diameter of the conduit.
  - 5. Maintain a minimum cover of 24 inches below final grade of conduits, or greater as required by the telephone utility company.
  - 6. Service entrance conduits shall be provided and installed by the electrical contractor in accordance with the telephone utility company rules, regulations, and installation guide.
  - 7. Service entrance conduits shall extend from the telephone equipment room and/or backboard to the utility demarcation/customer termination point on the site as directed by the local telephone utility company.
  - 8. Telephone equipment backboards shall be provided where indicated on the plans. Backboard shall be constructed of 1/2" B-D INT DFPA grade plywood secured to wall. Contractor shall install two sheets on end to cover entire exterior wall of equipment room. Backboards shall have two coats of ASA #61 light grey finish on all sides. Backboards shall not be installed in the MDF over the 3/4" fire-rated AC plywood that has been installed per BICSI TIA-942 "Telecommunications Infrastructure Standard for Data Centers" Section 5.4.8.3.
  - 9. Service entrance conduits shall be 2 @ 4" inside diameter galvanized rigid steel. Schedule 40 PVC may be used where acceptable to local authorities having jurisdiction and the local telephone utility company providing service to the site.

**PART 3 - EXECUTION****3.01 INSTALLATION**

- A. Provide 1-#6 ground conductor in 3/4" conduit from telephone equipment backboard to the nearest accessible cold water pipe or building ground for telephone company's connection.
- B. Provide a Brady "Write-On" label on each conduit at each telephone wood backboard and designate on the label the room or rooms served by the conduit.
- C. Label all telephone outlet boxes (indicate as voice, data, or combination using the symbols as shown on the plans). Labels shall be affixed on the inside back of the box.
- D. All telephone conduits shall be continuous from the outlet box to the telephone equipment backboard in the equipment room, unless otherwise indicated on the plans.
- E. Where acceptable to local authorities having jurisdiction, telephone conduits shall not be required running horizontally across the ceiling.
- F. Conduit protection for vertically run cable is required from the outlet box to the ceiling as indicated on the drawings. Provide NEC-CMP type FPLP (or other locally approved fire resistant, low-smoke producing) telephone cable if required by the local authorities of jurisdiction or enclose PVC jacket cable in conduit.
- G. It is the responsibility of the electrical contractor to coordinate the type of telephone cable used and the local authorities acceptance or rejection of exposed cabling with the electrical work as indicated on the plans. This coordination shall be performed by the electrical contractor prior to the bid of construction documents.
- H. All raceway systems, outlets, lighting, grounds, backboards, cabinets, and pull lines relative to the telephone system shall be completely installed prior to the premises telephone wiring contractor arrival on site in compliance with BICSI TIA-569 "Commercial Building Standard for Telecommunications Pathways and Spaces" and any local codes that apply. In general, all telephone system wiring should be installed not less than five (5) weeks prior to turn over of the building to Home Depot for racking and merchandising.

END OF SECTION



**Construction Specification****(FBO) INFORMATION TRANSPORT SYSTEM****PART 1 - GENERAL****1.01 SUMMARY**

- A. This section of the specifications includes the furnishing and installation of Information Transport System (ITS) hardware and wiring including:
  - 1. Termination Hardware for Main Distribution Frame (MDF) and Intermediate Distribution Frames (IDF)
  - 2. Dataline Termination
  - 3. Closed Circuit Television (CCTV) Cable and Termination Hardware
- B. Provide a complete system of low-voltage ITS wiring and termination hardware as shown on the drawings and per the requirements of the Home Depot IT Department. The ITS shall be complete and continuous, without splice, from the service entrance to each and every apparatus that require connections.
- C. Scope Of Work
  - 1. Electrical Contractor responsible for providing and installing: Conduit, Boxes and associated Hardware per the requirements of Section 16125.
  - 2. ITS Contractor is responsible for providing and installing: Cabling, IDF Cabinets and making all Low Voltage final connections and terminations.
  - 3. Closed Circuit Television Contractor (CCTV Contractor) is responsible for providing and installing: Video Cameras, Monitors, UTP video transmission equipment, power supplies, Mounting Accessories, and making final connections of all cabling as supplied and installed by others per the requirements of Section 13700.
- D. Related Sections:
  - 1. Section 01010 - Furnished By Owner Items
  - 2. Section 13700 - Closed Circuit Television (CCTV)
  - 3. Section 16100 - Basic Materials and Methods
  - 4. Section 16120 - Wire and Cables
  - 5. Section 16125 - Low-Voltage Wiring

**1.02 REFERENCES**

- A. BISCII - Telecommunication Distribution Methods Manual

**1.03 FBO PROCEDURES**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section. General requirements related to Furnished by Owner (FBO) Items are as defined in Section 01010. All FBO Forms listed below are included as part of Section 01010.
- B. Vendor Contact: Contractor shall send a completed "FBO Form A: Contractor Information Form" to the FBO vendor indicated below, twelve (12) weeks prior to the scheduled installation of the specified system:
 

ITS Contractor:  
 Black Box Network Services  
 2707 Main Street  
 Duluth, GA 30096  
 Contact: Andy Joyner  
 Office: (678) 475-5586  
 Fax: (678) 773-8388  
 E-Mail: andy.joyner@blackbox.com
- C. Take-Offs: FBO Vendor shall provide "take-offs" to the Contractor as specified in Section 01010. The Contractor shall then verify this "take-off" using an "FBO Form B: Take Off Conformation Sheet".
- D. Receipt Of Shipment: Contractor shall verify shipment per the requirements of Section 01010 and complete the "FBO Form C: Confirmation of Shipment" and submit back to the FBO vendor.
- E. Request for Changes: Changes to materials and quantities after receipt of shipment shall be coordinated by the contractor with the FBO vendor per the requirements of Section 01010 using an "FBO Form D: Request For Additional/Replacement Materials".
- F. Return Merchandise Authorization Policy: The Home Depot will add to the contractors' scope of work the responsibility for coordinating (1) customer accommodation return request through the FBO Vendor. Requests shall be submitted using the "FBO Form E: Returned Materials" as specified in Section 01010.

**PART 2 - PRODUCTS**

**Construction Specification****(FBO) INFORMATION TRANSPORT SYSTEM****2.01 NETWORKING CABINETS AND RACKS**

- A. Provide all MDF and IDF racks and cabinets as shown in the drawings and directed by Home Depot IT.

**2.02 NETWORKING DEVICES**

- A. Provide all MDF and IDF network devices as shown in the drawings and directed by Home Depot IT.

- B. Termination Hardware for MDF and all IDFs (existing and new)

	<u>COLOR</u>	<u>CATEGORY</u> <u>/TYPE</u>	<u>AVAYA/VENDOR PART #</u>
MDF/IDF patch panel	Black	CAT5E	1100CAT5PS-24 (24 port)
Out-of-Band Management Patch Panel	Black	CAT5E	Fleximax High Density 24-port
Dataline Wire Managers	N/A	N/A	Ortronics Single-Pass Through Wire Manager OR Ortronics Double-Pass Through Wire Manager
Fiber Terminator-each individual fiber	N/A	SC	Simplex SC fiber optic connector that supports a 0.9 mm buffered fiber
Fiber Termination Panel-(for 6 strand)	N/A	SC/MM	(12) SC/MM simplex adapters
Fiber Termination Shelf-(for panel)	N/A	Rack-mount	600B2 Sliding Combination Fiber Shelf

- C. Dataline Termination

	<u>COLOR</u>	<u>CATEGORY</u> <u>/TYPE</u>	<u>AVAYA/VENDOR PART #</u>
Dataline Termination Jacks	Slate Gray	CAT5E	MPS100E-270 (568B pin-out standard)
Dataline Termination Jacks "DATA"	Slate Gray	N/A	M61H-270
Icons			NOTE: Use the "DATA" icon

**2.03 LOW-VOLTAGE CABLING**

- A. Provide low-voltage wiring per the requirements of Section 16125

**PART 3 - EXECUTION****3.01 INSTALLATION**

- A. All work shall conform to BICSI TIA-568 "Commercial Building Wiring Standard". It is the responsibility of the ITS Contractor to determine in advance, all requirements of the local authorities of jurisdiction governing low voltage exposed cabling prior commencement of work.
- B. Where exposed low-voltage PVC jacketed cabling is not allowed by local authorities, the ITS Contractor shall determine an alternate wiring system that is acceptable to the local authorities:
1. First Option: Install NEC-CMP rated, type FPLP (low smoke producing, fire resistant) exposed cable.
  2. Second Option: Install all low voltage PVC jacketed cable in continuous EMT conduit between all terminations and connections.

The ITS Contractor shall notify the Home Depot immediately upon any requirement for alternate wiring. Home Depot shall then notify the electrical contractor, who shall provide and install the alternate wiring system per the requirements of Section 16125.

**END OF SECTION**

**PART 1 - GENERAL****1.01 SUMMARY**

- A. This section of the specifications includes the furnishing and installation of Home Depot Television (HDTV) hardware and wiring including:
1. TV cabling and termination hardware
  2. TV satellite
- B. Provide a complete system of HDTV wiring and termination hardware as shown on the drawings and per the requirements of the Home Depot IT Department. The HDTV system shall be complete from the service entrance to each and every apparatus that require connections.
- C. Scope Of Work
1. Electrical Contractor responsible for providing and installing: Conduit, Boxes and associated Hardware per the requirements of Section 16125.
  2. HDTV Contractor is responsible for providing and installing: Satellite, Cabling and making all Low Voltage final connections and terminations.
- D. Related Sections:
1. Section 16100 - Basic Materials and Methods
  2. Section 16120 - Wire and Cables
  3. Section 16125 - Low-Voltage Wiring

**1.02 FBO PROCEDURES**

- A. The General and Supplementary Conditions, and General Requirements (Division 1), apply to the work specified in this Section. General requirements related to Furnished by Owner (FBO) Items are as defined in Section 01010. All FBO Forms listed below are included as part of Section 01010.
- B. Vendor Contact: Contractor shall send a completed "FBO Form A: Contractor Information Form" to the FBO vendor indicated below, twelve (12) weeks prior to the scheduled installation of the specified system:

HDTV Contractor:  
Verizon Business  
1901 10<sup>th</sup> Street, suite 100  
Plano, TX 75074  
Contact: Jeff Leonard  
Direct: 972-578-7104 (disconnected or no longer in service)  
Fax: 972-578-7188  
E-Mail: [jeff.leonard@verizonbusiness.com](mailto:jeff.leonard@verizonbusiness.com) (undeliverable)

- C. Take-Offs: FBO Vendor shall provide "take-offs" to the Contractor as specified in Section 01010. The Contractor shall then verify this "take-off" using an "FBO Form B: Take Off Confirmation Sheet".
- D. Receipt Of Shipment: Contractor shall verify shipment per the requirements of Section 01010 and complete the "FBO Form C: Confirmation of Shipment" and submit back to the FBO vendor.
- E. Request for Changes: Changes to materials and quantities after receipt of shipment shall be coordinated by the contractor with the FBO vendor per the requirements of Section 01010 using an "FBO Form D: Request For Additional/Replacement Materials".
- F. Return Merchandise Authorization Policy: The Home Depot will add to the contractors' scope of work the responsibility for coordinating (1) customer accommodation return request through the FBO Vendor. Requests shall be submitted using the "FBO Form E: Returned Materials" as specified in Section 01010.

**PART 2 - PRODUCTS****2.01 LOW-VOLTAGE CABLING**

- A. Coaxial Cable and Termination Hardware

	<u>COLOR</u>	<u>PART#</u>	<u>CITRIX ZZ#</u>
RG-6 Coaxial Cable	White	HD-806	ZZ-BBNS-0037375
Twist On 'F' Connectors	N/A	FA866	ZZ-BBNS-0037376
Stainless Plate 'F' to 'F'	N/A	WP210	ZZ-BBNS-0037377

PART 3 - EXECUTION

3.01 INSTALLATION

- A. It is the responsibility of the HDTV Contractor to determine in advance all requirements of the local authorities of jurisdiction governing all work to be performed prior commencement of work.

END OF SECTION

**PART 1 - GENERAL****1.01 GENERAL REQUIREMENTS**

- A. This section of the specifications includes the provision and installation of the fire alarm system. The fire alarm and electrical contractors shall include in their bids all monies required to provide a 100% fully functional fire alarm system per drawings and specifications. The fire alarm contractor shall be responsible for the installation of the fire alarm system. The project architect is responsible for providing to the fire alarm system installation contractor drawings and specifications for bidding and construction.
- B. All labor, as indicated, shall be provided by the electrical contractor and fire alarm system contractor. The electrical and fire alarm contractors are responsible for contracting and scheduling the work of the fire alarm system installation. The alarm contractor shall notify the Home Depot project manager of the fire alarm system contractor's scheduled date(s) on-site, not less than two (2) weeks in advance.
- C. The fire alarm system is a FBO (furnished by owner) program with the alarm contractor bidding directly to The Home Depot and the electrical contractor is under the general contractor. The alarm contractor is responsible for providing and the installation of low voltage cabling, conduit on the interior of the building, garden center and enclosed gate areas. The general contractor is responsible for the installation and provision of exterior conduit to all remote devices (pump houses, post indicator valves, vaults, etc.). The electrical contractor is responsible for high voltage wiring (main power) and associated conduit. The electrical contractor shall provide his bid to the general contractor.
- D. The requirements of the Contract Documents, including the General and Supplementary General Condition and Division 1 - General Requirements shall apply to the work of this section.
- E. At the time of bid the electrical and fire alarm contractors shall list all exceptions taken to these specifications, all variances from these specifications and all substitutions of operating capabilities or equipment called for in these specifications and forward said list to the FPE. Any such exceptions, variances or substitutions that were not listed at the time of bid and are identified in the submittal, shall be grounds for immediate disapproval without comment. Final determination of compliance with this Specification shall rest with the FPE, who, at their discretion, may require proof of performance.
- F. All fire alarm equipment shall be furnished by the specified fire alarm contractor under this section. The general contractor shall coordinate all work as provided for in this section with all other related sections and trades.
1. The Home Depot Fire Protection Engineer, herein referred to as FPE, is Telgian Corporation. The FPE primary contact is Ralph Bless (480) 753-5444. The primary design contact is Brian Scudder (480) 621-5083.
  2. The preferred and only acceptable fire alarm installation company to be utilized for this project is:  
  
Telgian Corporation  
Brian Scudder  
33300 5 Mile Road  
Suite 106  
Livonia, MI 48154  
E-mail: [bscudder@telgian.com](mailto:bscudder@telgian.com)  
(480) 621-5083

**1.02 RELATED WORK**

Division 16: Basic materials and methods  
Division 15: Fire Protection Systems  
Division 15: HVAC Systems

**1.03 RESPONSIBILITIES**

- A. This section of the specification includes the provision and installation of the fire alarm system. The alarm contractor shall include in his bid all monies required to install a fully functional fire alarm system. The alarm contractor shall include in his bid, troubleshooting and replacement of devices found inoperable. The alarm contractor shall include in his bid, testing and retesting if necessary to provide a 100% fully operational system approved by the authority having jurisdiction and Telgian. The alarm contractor shall provide all tools, lifts, materials and labor to install all cable, conduit and equipment as necessary.
- B. The alarm contractor shall provide all tools, lifts, materials and labor to pipe, and install all mounting and equipment enclosures as required per drawings and specifications. This installation shall reflect the FPE shop drawings as much as practically possible.

- C. The electrical contractor shall provide and install as necessary all tools, lifts, materials, labor, cable and conduit for high voltage wiring and exterior conduit to the fire alarm system, power supplies and associated equipment per FPE drawings and specifications.
- D. The alarm contractor shall coordinate with the electrical contractor scheduling for the installation of the conduit, boxes etc., for the fire alarm system.
- E. The alarm contractor shall be licensed in the field of fire alarm system installation meeting all local, state and national requirements.
- F. The alarm contractor shall contact the FPE with any comments, exceptions and/or reservations to the drawings and specification prior to bid. By not identifying any differences prior to bid, the contractor is not entitled to any additional money.
- G. The alarm contractor shall provide a motorized aerial work platform and ladder for use during the entire period of the fire alarm installation. The platform shall be capable of any work elevation inside the building.
- H. All conduit, boxes (unless otherwise indicated), fittings, couplings, connectors, straps, supports, pull strings, bushings, etc., shall be provided and installed by the fire alarm contractor for devices on the interior of the building, garden center and enclosed gate areas. The general contractor is responsible to provide and install exterior conduit to remote located devices. Any wiring outside the building shall be rated as weatherproof and installed within weatherproof conduit and junction boxes.
- I. The electrical contractor shall provide and install all line voltage (120 V. max.) circuiting in separate conduit.
- J. Low-voltage circuiting shall be installed exposed using fire rated cable per NEC Article 760 unless otherwise noted by local jurisdictional authorities. All exposed cable below the bottom bar joist of other roof structure protruding lower, or other locations where the cable may become exposed and/or damaged, shall be within a steel conduit by fire alarm contractor.
- K. System operation, testing, turn over, warranty, compliance and after market service shall be provided by the alarm contractor.
- L. The fire alarm system must be complete prior to the acceptance test date. The alarm contractor will be responsible for all travel costs and other related expenses, should the associated work of the alarm contractor not be complete at the time of the scheduled on-site acceptance test date. The alarm contractor shall also be responsible for reimbursements of cancellation charges incurred by Telgian if advance travel plans must be altered after test is scheduled. The alarm contractor shall be back charged for all costs incurred.
- M. A written report shall be prepared by the FPE and submitted to the Home Depot representative at the completion of the project, prior to turn over. This report shall outline the acceptance-test results and identify any items not completed or fully operable. Any item that is identified in this report must be corrected by the fire alarm contractor and the system must be fully operable prior to turn over.
- N. The fire alarm contractor shall provide the following fire alarm equipment as indicated on the FPE drawings:
  - 1. Fire alarm control panel
  - 2. Stand-by batteries
  - 3. Annunciators
  - 4. Manual pull stations
  - 5. Area smoke detectors
  - 6. Duct smoke detectors (if applicable)
  - 7. Control relays (HVAC shutdown, door release, etc) (if applicable)
  - 8. Notification appliances (horns, strobes, bells, etc) (if applicable)
  - 9. Modules for monitoring initiating devices (waterflow switches, gate valves, sprinkler tamper switches, PIV's, fire pump, dry pipe system etc.)
  - 10. Radio/Master boxes (if applicable)

The fire alarm contractor shall be responsible for providing all equipment and labor to provide a 100% fully operational system, tested and approved by local, state and national authorities.

Any additional equipment not indicated on the FPE drawings and added by state and local authorities shall be immediately reported to the FPE. The fire alarm contractor shall provide additional equipment deemed necessary, unless otherwise directed by FPE personnel. Any deviations shall be grounds for disapproval of payment.

- O. The FPE will provide approved drawings to the alarm contractor for installation. The alarm contractor shall be responsible for acquiring permit. All plan review and permit fees shall be paid by owner.
- P. The fire alarm contractor shall program the control panel per the FPE drawings and specifications. It may be necessary for

the alarm contractor to make adjustments to the program per FPE instructions. The alarm contractor shall include in his bid adequate time to provide additional modifications if necessary.

- Q. The alarm contractor shall install, terminate and test the fire alarm system until fully operational.
- R. The alarm contractor shall obtain final approval from state and local authorities. (If applicable)
- S. The alarm contractor shall provide services necessary to obtain final approval deemed necessary until final approval is obtained by state and local authorities. (If applicable)
- T. The alarm contractor shall provide a professionally operated guard service / fire watch, if system is not complete two (2) weeks prior to turnover, tested and approved by the authority having jurisdiction. The guard service / fire watch shall be provided until such systems are found acceptable and approved by the FPE and/or The Home Depot and the Authority Having Jurisdiction. The alarm contractor shall be responsible for all costs incurred by not meeting these requirements.
- U. The alarm contractor shall provide the FPE with address, name, phone number, and e-mail address of those individuals directly responsible for the installation of the Fire Alarm System.
  - 1. If this store is undergoing a remodel, which will affect the installation. The alarm systems must be functional every night, with no loss of protection. The remodel schedule must be strictly adhered to for facilitation of wiring areas during demolition, before finished construction. New areas where devices must be installed shall be scheduled as to allow no loss of protection. The store may not be left unprotected after hours. If the facility's fire system cannot be utilized the installing contractor shall be responsible to provide a professionally operated guard service/fire watch at their cost.
  - 2. Equipment present in the store that shall not be activated on the new system shall be removed.
  - 3. All wiring to be abandoned shall be removed.
  - 4. A blank cover plate shall replace each abandoned device, or wall be repaired (drywall).
- V. At the end of each work day, during the install, the installing contractor shall clean up all debris, fingerprints, dust from drilling, etc. Any work not completed shall be left in a manner that will not affect any other operation.
- W. The installing contractor shall perform a pre-installation teleconference, with the FPE project supervisor, prior to start of project. The installing contractor shall respond to the in-progress status reports, at critical milestones, via email, as dictated by the FPE.
- X. The installing contractor shall attend weekly construction meetings on site, as indicated by the general contractor or by the THD project manager.
- Y. The installing contractor shall coordinate the installation of conduit (high voltage wiring) with the electrical contractor for exact locations and scheduling.

#### 1.04 SCOPE

- A. The work covered by this section of the specification shall include all labor, equipment, materials and services to furnish and install a complete fire alarm system of the zoned, non-coded general alarm type. It shall be complete with all necessary hardware, software and memory specifically tailored for this installation. It shall be possible to permanently modify the software on site by using a plug-in programmer. The system shall consist of, but not be limited to, the following:
  - 1. Fire alarm control panel listed for all intended applications
  - 2. Remote annunciator
  - 3. Addressable manual fire alarm pull stations
  - 4. Addressable analog area smoke detectors
  - 5. Addressable analog duct smoke detectors
  - 6. Addressable analog heat detectors
  - 7. Sprinkler waterflow alarm switches
  - 8. Audible notification appliances; bells, horns, speakers
  - 9. Visual notification appliances; strobes
  - 10. Central station alarm connection
  - 11. Air handling systems shutdown control where required
  - 12. Dry pipe sprinkler release valve supervision
  - 13. Smoke exhaust systems startup control
  - 14. Sprinkler supervisory switches and tamper switch supervision
  - 15. Emergency generator supervision
  - 16. Fire pump supervision
  - 17. Battery standby

**1.05 QUALITY ASSURANCE****A. Manufacturer**

1. The system and components shall be manufactured by Silent Knight, Altronix, System Sensor or as indicated on FPE drawings.
2. The equipment described in this section represents the function and type of some of the materials required and herein specified. The equipment indicated in this section does not intend to be a complete list of all components required for an operational and approved system but only as guidelines. Additional equipment not herein specifically indicated but is a necessary part of an operational and approved system shall be provided by the fire alarm contractor as required.

**B. Equipment Handling**

1. The fire alarm contractor shall provide each piece of equipment in durable shipping cartons.
2. The alarm contractor is responsible for receiving the system at the site, or predetermined location, review order for completeness, inspect all cartons for damage and correct labeling. Once received the alarm contractor shall take full responsibility for the storage and protection of all materials.
3. The alarm contractor shall provide and replace at their cost any equipment lost or damaged after receipt. Replacement equipment shall be of the same manufacturer make and model as indicated on FPE drawings.

**C. Applicable Installation Codes and Standards**

1. All equipment shall be UL listed for its intended use.
2. NFPA Standard 72.
3. The National Electric Code.
4. All other applicable local and national codes/standards and authorities having jurisdiction.
5. Americans with Disabilities Act Accessibilities Guidelines (ADA(AG)).

**D. Standards**

1. The system shall be installed per the following standards as applicable:
  - UL 864/UOJZ, APOU Control Units for Fire Protective Signaling Systems.
  - UL 268 Smoke Detectors for Fire Protective Signaling Systems.
  - UL 268 A – Smoke Detectors for Duct Applications.
  - UL 228 Door Closures-Holders for Fire Protective Signaling Systems.
  - UL 464 Audible Signaling Appliances.
  - UL 1971 Visual Signaling Appliances.
  - UL 38 Manually Actuated Signaling Boxes.
  - UL 346 Water flow Indicators for Fire Protective Signaling Systems.
  - UL 1481 Power supplies for Fire Protective Signaling Systems.
  - UL 521 Heat Detectors for Fire Protective Signaling Systems.

**E. Related Work**

1. The alarm contractor shall coordinate work in this Section with all related trades. Work and/or equipment provided in other Sections and related to the fire alarm system shall include, but not be limited to:
  - a. Sprinkler waterflow and supervisory switches, and low air supervisory switches shall be furnished and installed by the fire sprinkler contractor. The fire alarm contractor is responsible for piping to an accessible junction box and provide a flexible raceway to the final termination at the device. All riser room conduits and boxes shall be weatherproof. Module and sprinkler system monitoring device termination's by alarm contractor.
  - b. Duct smoke detectors (if applicable) shall be furnished by the fire alarm contractor. The alarm contractor shall be responsible for all wiring to the detector and from fire alarm system N.O. contacts (i.e. addressable control relay module) to respective HVAC unit fan motor starter control circuit terminations. The duct detector housing, sampling tube, conduit and chase through roof to HVAC equipment shall be installed by the alarm contractor. Termination to the HVAC unit shall be performed by the electrical contractor.
  - c. Air handling and smoke exhaust system fan control circuits and status contacts to be furnished by the HVAC control equipment.
  - d. Elevator recall control circuits to be provided by the elevator control equipment supplier (If applicable).



- e. Dry pipe sprinkler system valve control circuit and supervision contacts shall be provided by the dry pipe sprinkler system control equipment supplier.
  - f. Emergency generator supervision contacts to be provided by the emergency generator control equipment supplier (if applicable).
  - g. Fire pump supervision contacts, as required on the drawings, to be provided by the fire pump control equipment supplier.
  - h. Raceways (Conduit).
  - i. Outlet boxes and junction boxes.
  - j. Grounding as per The Home Depot standards.
- F. Warranty
- 1. The alarm contractor shall warranty the system for a period of 1 year from grand opening. The alarm contractor shall replace all warrantied equipment (labor and equipment) within the warrantied period at no cost if equipment has failed due to manufacturers' equipment failure.
  - 2. The warranty shall include:
    - a. All equipment provided by the alarm contractor.
    - b. Labor to replace all equipment.
    - c. Cable provided and installed by the alarm contractor.
    - d. Connectors provided and installed by the alarm contractor.
    - e. Supporting hardware provided and installed by the alarm contractor.
    - f. The alarm contractor shall guarantee all wiring and raceways to be free from inherent mechanical or system defects.
  - 3. The alarm contractor shall include in the warranty, replacement and/or purchasing of equipment. The alarm contractor shall not invoice The Home Depot for any equipment or labor found defective due to equipment or labor failure within the warranty period.
  - 4. Upon completion of the installation of fire alarm system equipment, the alarm contractor shall provide to The Home Depot project manager a signed written statement, substantially in form as follows: "The undersigned, having engaged as the alarm contractor on the [Name of Project] confirms that the fire alarm system equipment was installed in accordance with the wiring diagrams, instructions and directions provided to us by the FPE.
  - 5. Alarm contractor is required to include all labor required to perform warranty work during warranty period.
    - a. This warranty work will include replacement of warranty components, ordering warranty components, installing or reinstalling warranty components and all management and labor required to satisfy warranty issues.

## 1.06 SYSTEM OPERATION

### A. General

- 1. The fire detection and alarm system shall detect all changes in status of monitored points and shall initiate appropriate actions to alert and/or evacuate occupants, provide event annunciation and actuate auxiliary controls as specified herein.
- 2. The system shall accept, process and evaluate the following types of signals:
  - a. Automatic fire detectors
  - b. Manual alarm pull stations
  - c. Sprinkler waterflow switches
  - d. Sprinkler tamper switches
  - e. Other supervisory type inputs
  - f. Control relay response confirmations
  - g. Detector sensitivity data
  - h. Dry pipe canopy sprinkler system inputs
- 3. Addressable type smoke detectors shall have their sensitivity continuously monitored.
- 4. Walk test mode shall test initiating devices and circuits, and indicating devices and circuits from the field without returning to the panel to reset the system. Upon activation of an initiating device, the associated visual and audible output shall operate for approximately six seconds.
- 5. When an alarm condition is detected on an initiating device circuit that has been programmed for alarm verification,

- the system shall automatically enter the alarm verification mode. If the alarm condition is still present after a preset time period, the system will automatically enter the alarm mode.
6. The fire alarm control panel (FACP) shall communicate with field devices over one or more style 4 addressable signaling line circuits.
  7. Sub-circuits from addressable input/output modules, used to interface input/output devices (i.e. bells, conventional fire detectors, tampers, etc.) shall be supervised. Initiating circuits shall be wired for Style B operation and indicating circuits wired for Style Y operation. Supervision shall include open circuit, short circuit and ground fault. Modules requiring external power for operation of two-wire conventional detector sub-circuits and initiating device circuits shall supervise the presence of external power.
  8. The system shall provide summary printouts, initiated by operator command, that include the following information:
    - a. Values of all points including instantaneous value and long term average value
    - b. Points isolated
    - c. Points tested/failed test
    - d. Points out of sensitivity compensation
    - e. Event log contents
  9. The FACP shall be on site and remote programmable.
  10. The system shall provide for the disabling of a single point or group of points. The system shall ignore signals from input devices when disabled. The system shall annunciate and remain in a trouble state while any device is disabled.
  11. The system shall provide identification of point type, location and status. Each addressable device shall have a field assigned 20-character zone identification message and a unique 16-character device identification message.
  12. The system shall provide standby batteries for complete system operation during AC power outages.
    - a. A fault condition shall be indicated when the system is operating on standby battery. When AC power is restored the system shall revert back to AC power without operator intervention or manual restart.
- B. System Alarm Operation
- Activation of any initiating device shall initiate the following system alarm response:
1. Sound an evacuation signal in all locations specified on the drawings. Temporal pattern code 3, unless otherwise required by state and local authorities.
    - a. The evacuation signal shall consist of an audio signal sounding the prescribed alarm audible until silenced or reset.
  2. Activate all connected visual alarm strobes that are specified on the drawings. Upon operation of system silence, audible signals shall silence while visual signals shall continue to operate until the system is reset.
  3. The alarm condition shall be visually and audibly indicated at the FACP as follows:
    - a. Illuminate a red "system fire alarm" LED indicator.
    - b. Continuously sound an audible buzzer at the FACP that shall sound until the system is silenced.
    - c. Display specific information about the alarm condition on the LCD as follows;
      - i. Type of event
      - ii. Numeric identification of point and zone in alarm
      - iii. 16 character text message unique to the specific point in alarm
      - iv. 20-character text message associated with the zone in alarm
  4. The system shall display the alarm condition at all remote annunciator and display panels shown on the drawings. These panels shall contain the identical controls and indicators as contained on the FACP.
  5. Activate the digital communicator to the central station service.
  6. Operation of the system silence switch shall silence all connected audible appliances with the exception of appliances designated as not to be silenced in response to an alarm from a waterflow alarm. All displays shall remain illuminated until the system has been cleared and reset. In the event of a subsequent alarm after system silence, the FACP shall resound the building alarm signals. All audible appliances that had been previously silenced shall resound and all audible appliances programmed to respond to the new alarm condition shall activate.

7. Each event shall be individually acknowledged before the system can be returned to normal operation. Access to the acknowledge function shall be key or code restricted such that only authorized personnel may operate.
8. If applicable the system shall direct the HVAC system fans, dampers and other equipment as indicated on the shop drawings in accordance with relevant local, state and national codes and standards.
9. If applicable, a system shall recall building elevators as indicated on the shop drawings.
10. If applicable, any egress doors equipped with time-delay hardware will automatically release upon power loss at the mechanism, the fire alarm system, or upon alarm initiation in accordance with relevant local, state and national codes and standards and FPE drawings and specifications.

C. Supervisory Operation

The system shall activate a supervisory condition when a sprinkler tamper or other supervision input is activated. The supervisory condition shall cause the following system response:

1. The supervisory condition shall be visually and audibly indicated at the FACP as follows;
  - a. Illuminate a yellow system "supervisory" LED indicator.
  - b. Pulse an audible buzzer at the FACP that shall sound until the system is silenced.
  - c. Display specific information about the supervisory condition on the LCD as follows;
    - i. Type of event
    - ii. Zone and point numeric identification
    - iii. 16 character text message unique to the specific point causing the supervisory condition
    - iv. 20 character text message associated with the zone in the supervisory condition
2. The system shall display the supervisory condition at all remote annunciators and display panels shown on the drawings. These panels shall contain the identical controls and indicators as contained on the FACP.

PART 2 - PRODUCTS

2.01 FIRE ALARM SYSTEM

- A. All equipment shall be of make and model as indicated on FPE drawings. No other alternates to the drawings and specifications will be considered, unless written approval is received from the FPE.
- B. In all cases, the alarm contractor shall install both the alarm and security systems for a given Home Depot, unless otherwise directed by the Home Depot or FPE personnel.

2.02 FIRE ALARM CONTROL PANEL

- A. Fire alarm control panel shall be manufactured by Silent Knight or as determined by the FPE.
- B. The fire alarm control panel shall incorporate all control electronics, relays and necessary modules and components in a surface or semi-flush mounted cabinet. The operating controls and zone/supervisory indicators shall be located behind locked door with viewing window. All control modules shall be labeled, and all zone locations shall be identified. The cabinet shall be 18 GA. steel, with a permanent finish. The assembly shall contain a base panel, system power supply and battery charger with optional modules suitable to meet the requirements of these specifications.
- C. System circuits shall be capable of configuration as follows: Addressable loops Class A or B; Initiating Device Circuits Class A or B; Notification Appliance Circuits Class A or B.
- D. The system shall be supervised, site programmable, remote programmable and of modular design with expansion modules.
- E. The system shall store all basic system functionality and job specific data in non-volatile memory. The system shall survive a complete power failure intact.
- F. The system shall allow down loading of a job specific custom program created by system application software. It shall support programming of any input point to any output point. It shall allow authorized customization of fundamental system operations using initiating events to start actions, timers and sequences.
- G. The system shall use full digital communications to supervise all addressable loop devices for installation, addressing and operation.
- H. The system shall have a UL Listed Detector Sensitivity test feature, which will be a function of the smoke detectors and

performed automatically every 3 hours.

- I. The system shall support 100% of all remote devices in alarm.
- J. All panel modules shall be supervised for placement and return trouble if damaged or removed.
- K. The system shall have a CPU watchdog circuit to initiate trouble should the CPU fail.
- L. The system evacuation signal rate shall be continuous.
- M. Audible notification appliances shall be affected by signal silence features. Visual signal appliance shall not be affected by signal silence features.
- N. The system program shall meet the requirements of this project, current codes and standards and satisfy the local Authority Having Jurisdiction.
- O. Passwords shall protect any changes to system operations.
- P. The power supply shall provide line monitoring to automatically switch to batteries for power failure or brown out conditions. Input power shall be 120 VAC, 60 HZ. The automatic battery charger shall have low battery discharge protection. The power supply shall provide internal power and 24 Vdc at 5A for notification appliance circuits. The power supply shall be capable of providing 8A to output circuits for a maximum period of 5 s. Auxiliary power shall be 24 Vdc at 1A. All outputs shall be power limited.
- Q. Auxiliary Power Supply: Provide where required a switching power supply that provides auxiliary 24 VDC power for system devices (conventional detectors and indicating appliances).
  - 1. Brownout and loss of AC power shall cause automatic changeover to connected standby battery supply sized to provide for the attached load in accordance with control equipment specifications.
  - 2. AC line, battery condition and output wiring ground faults shall be monitored by the power supply and signaled to the FACP. A Ground Fault LED shall be provided on the power supply unit. Battery condition monitoring shall include low voltage, missing batteries, reverse connection and shorted battery connection. Reverse and shorted battery connections shall not damage the power supply.
  - 3. The power supply assembly shall consist of the power supply/battery charger mounted within a dedicated and locked enclosure designed for surface wall mounting.
  - 4. The power supply shall provide a regulated 24 VDC output at 6 Amps. Power supply outputs shall meet NFPA standards for power limited/class 2 circuits.
- R. The LCD Display Module shall be of membrane style construction with liquid crystal display. The LCD shall use backlighting for high contrast visual clarity. In the normal mode display the time, the total number of active events and the total number of disabled points. In the alarm mode display the total number of events and the type of event on display. Reserve 40 characters of display space for user custom messages. The module shall have visual indicators for the following common control functions; AC Power, alarm, supervisory, monitor, trouble, disable and ground fault. There shall be common control keys and visual indicators for; reset, alarm silence, trouble silence, drill and forward / backward scrolling through event listings. The operation of these keys shall be integrated with the related common control indicators to flash the indicators when undisplayed events are available for display and turn on steady when all events have been displayed. Allow the first event "the highest priority to capture the LCD for display so that arriving fire fighters can view the first alarm event hands free." Provide system function keys; status, reports, enable, disable, activate, restore, program and test. The module shall have a numeric keypad, zero through nine with delete and enter keys.
- S. The main controller module shall control and monitor all local or remote peripherals. It shall support the LCD display module, power supply, remote LCD and zone display annunciators.
- T. The panel shall have:
  - 1. An interface module for remote site monitoring. The module shall have the capability for local energy municipal loop and reverse polarity connections for each of alarm, supervisory and trouble.
  - 2. Zone display indicator modules to annunciate zones per the fire alarm zoning schedule.
  - 3. The following conditions shall be indicated on the 80 character alphanumeric display mounted on the face of the fire alarm control panel and remote annunciator:
    - a. AC Power
    - b. System Alarm
    - c. Supervisory Device Activation

- d. System Trouble
    - e. Signals Silenced
    - f. Module Failure
    - g. Power Trouble
    - h. Initiating Device Alarm
    - i. Initiating Device Trouble
    - j. Indicating Circuits Trouble
  - 4. The following switches shall be provided on the FACP:
    - a. Acknowledge
    - b. Signal Silence
    - c. System Reset
  - 5. Fire Alarm Control Panel shall be capable of the following:
    - a. Selectable alarm verification and acknowledged.
    - b. Global acknowledge of troubles.
    - c. Self contained audible alarm system.
    - d. Self contained audible trouble system.
    - e. Municipal master box and reverse polarity connection circuit.
    - f. Transient suppression module for municipal connections and power supply.
  - 6. Alarm/trouble one man walk test.
    - a. Alarm resound.
- 2.03 REMOTE ANNUNCIATION
- A. Remote annunciators and Display Units shall be provided as shown on the drawings. The Fire Alarm control panel (FACP) shall be capable of supporting multiple remote units.
  - B. Each remote unit shall be equipped with identical controls and displays as found on the FACP.
  - C. Remote annunciators and display units are powered from the FACP and shall be fully supervised by the FACP. In the event of loss of local power or a failure in communications to a remote unit, both the FACP and remote unit(s) shall audibly and visually annunciate the fault condition.
  - D. Annunciator switches may be programmed for system control such as, global acknowledge, global signal silence and global system reset.
  - E. The alphanumeric display annunciator shall be a supervised, locally or remotely located backlit LCD display containing a minimum of eighty (80) characters for alarm annunciation in clear English text.
  - F. The LCD annunciator shall display all alarm and trouble conditions in the system.
  - G. LCD display annunciators shall mimic the main control panel 80 character display and shall not require special programming.
- 2.04 FIRE ALARM NOTIFICATION APPLIANCES AND EQUIPMENT
- A. Notification appliance devices (horns, strobes, bells, etc) shall be manufactured by System Sensor or as determined by the FPE.
  - B. Notification appliance power supplies shall be manufactured by Silent Knight.
  - C. General Notification Appliances
    - 1. All appliances shall be UL Listed for Fire Protective Service.
    - 2. All strobe appliances or combination appliances with strobes shall be capable of providing the "Equivalent Facilitation" that is allowed under the Americans with Disabilities Act Accessibilities Guidelines (ADA(AG)), and shall be UL 1971, UL 1638 and ULC S526 Listed.
  - D. Addressable Indicating Circuit Module: The alarm contractor shall furnish and install addressable indicating circuit modules and power supplies used to activate indicating appliances connected to its sub-circuit in response to command from the control equipment.
    - 1. The module shall interface to the alarm signaling appliances via a supervised, Style Y sub-circuit and shall be rated

- for 3 AMP output. All signaling appliances attached to the sub-circuit shall report their status and be activated as a single identity. The module shall be UL compatibility listed for use with the conventional 24 VDC type bells, horns and strobes used in this project.
2. FPE shall provide line voltage drop calculations that shall demonstrate that the voltage supplied at all indicating appliances are above the UL specified minimum for the indicating appliances employed. These calculations shall assume operation on standby batteries after the required standby period. The design shall provide sufficient quantities of addressable indicating circuit modules and 24 VDC power supplies, in the proper locations, to insure that the UL specified minimum voltage is present at all indicating appliances.
- E. Visual Indication and Audible Notification Appliances
1. All strobe appliances or combination appliances with strobes shall be capable of providing the "Equivalent Facilitation" that is allowed under the Americans with Disabilities Act Accessibilities Guidelines (ADA(AG)), and shall be UL 1971, UL 1638, and ULC S526 Listed.
  2. Strobes shall operate on 24 VDC nominal.
  3. Strobes shall meet the requirements of the ADA as defined in UL standard 1971 and shall meet the following criteria:
    - a. The maximum pulse per UL 1971.
    - b. Candela intensity shall meet the requirements of UL 1971.
    - c. The flash rate shall meet the requirements of UL 1971.
    - d. The wall mount appliances shall be placed 80 in (2,030 mm) above the highest floor level within the space, or 6 in (152 mm) below the ceiling, whichever is lower unless otherwise indicated.
    - e. The 115-cd strobe or horn strobe, UL 1971 listed for ceiling mounting, shall be placed at the bottom of the bar joist centered directly over the respective aisle. If a bar joist does not center directly over the aisle, the fire alarm contractor shall provide and install unistrut to meet this requirement. The fire alarm contractor shall coordinate installation and verify racking and lighting plans with general contractor prior to installation. The installing contractors are responsible for relocating devices if cable and devices are installed prior to installation of racking.
    - f. The fire alarm contractor shall coordinate location of devices with lighting fixture plan prior to installation. The installing contractors are responsible for relocating devices if cable and devices are installed prior to installation of lighting.
  4. Indoor devices shall be mounted on 4x4 square outlet boxes, surface mounted on columns, walls or joists in the sales area, flush mounted in the office or the interior side of tilt walls or block.
  5. Outdoor devices shall be mounted on 4x4 square cast weatherproof outlet boxes (2 gang Bell box). Strobes shall have outlet boxes with weatherproof covers. Horns shall be of the weatherproof type.
  6. Horns shall be minimum 83 dBA.
- 2.05 INITIATING DEVICES, EQUIPMENT, AND FIELD MODULES
- A. General - Intelligent Addressable Analog Devices
1. Furnish and install where indicated on the drawings.
  2. Each detector shall continually monitor the environmental impact of temperature and air-born contaminates. The process shall adapt the detector to long term environmental changes.
  3. Differential sensing algorithms shall maintain a constant sensitivity setting between the alarm threshold and compensated base line sensitivity. The base line sensitivity shall be updated approximately once every hour.
  4. All detectors shall be suitable for wall mount applications. The detector shall initiate a freeze warning signal at 40 degrees F/4.44 degrees C.
- B. Ceiling Mounted Fire Sensors
1. Addressable smoke and thermal detectors shall provide alarm and power/polling LED. The LED shall flash under normal conditions, indicating that the detector is operational and in regular communication with the control panel, and shall be placed into steady illumination by the control panel, indicating that an alarm condition has been detected.

2. Using software in the FACP, detectors shall automatically compensate for dust accumulation and other slow environmental changes that may affect their performance. The detectors shall be listed by UL as meeting the calibrated sensitivity test requirements of NFPA Standard 72.
  3. The detectors shall be ceiling-mount and shall include a separate twist-lock base.
  4. The detector shall transmit a trouble signal to the FACP when the detector has fallen out of its threshold, prior to an alarm condition, indicating the detector is in need of cleaning.
  5. Addressable devices shall provide address-setting means and shall also store an internal identifying code that the control panel shall use to identify the type of device. LED(s) shall be provided that shall flash under normal conditions, indicating that the device is operational and is in regular communication with the control panel.
  6. Intelligent photo detector shall use a light scattering type photo sensor. The detector shall be suitable for area protection and direct insertion into air ducts up to 3 feet high and 3 feet wide with air velocities up to 4000 ft./min. without requiring specific duct detector housings or supply tubes. The detector shall have a ULI smoke sensitivity range 0.67 - 3.77 % obscuration/ft. The detector shall be rated for ceiling installation at a minimum of 30-foot centers.
  7. Detector bases shall mount to North American 1 gang, 3 1/2 " or 4" octagon boxes, and a 4" square box. Removal of the respective detector shall not affect communications with other detectors. Terminal connections shall be made on the room side of the base. All detectors shall be compatible with any base.
- C. Intelligent Duct Smoke Detectors (If Applicable)
1. The in-duct smoke detector housing shall accommodate either an intelligent ionization detector or an intelligent photoelectric detector, that provides continuous monitoring and alarm verification from the panel. The detector shall transmit a trouble signal to the FACP when the detector has fallen out of its threshold, prior to an alarm condition, indicating the detector is in need of cleaning.
  2. When sufficient smoke is sensed, an alarm signal is initiated at the FACP, and appropriate action taken to change over air handling systems to help prevent the rapid distribution of toxic smoke and fire gases throughout the areas served by the duct system. An auxiliary relay will interrupt fan motor starter control voltage thereby rendering the fan motor inoperable.
  3. Provide and install LED source, addressable air duct photoelectric smoke detectors and integral twist-lock bases at locations as indicated on the drawings. Air duct smoke detector shall utilize same detector head as ceiling mounted photoelectric detector.
  4. Detector sampling tubes and housings shall be provided by the alarm contractor for installation as indicated on FPE drawings.
  5. Sampling tube length and tube openings shall be coordinated by the alarm contractor with the mechanical contractor. Detectors shall be installed where indicating LED can be visually inspected from the sales floor below, but as high in the ductwork as possible.
- D. Addressable Pull Station (manual alarm initiation)
1. Addressable pull boxes shall, on command from the control panel, send data to the panel representing the state of the manual switch and the addressable communication module status. They shall use a key operated test-reset lock, and shall be designed so that after actual emergency operation, they cannot be restored to normal use except by the use of a key.
  2. All operated stations shall have a positive, visual indication of operation and utilize a key type reset.
  3. Manual stations shall be constructed of Lexan (as a minimum) with clearly visible operating instructions provided on the cover. The word FIRE shall appear on the front of the stations in raised letters.
  4. Stations shall be suitable for surface mounting or semi-flush mounting as shown on the plans, and shall be installed not less than 42 inches, nor more than 48 inches above the finished floor.
- E. Addressable Dry Contact Monitor Module
1. Addressable monitor modules shall be provided to connect supervised IDC zones of conventional alarm initiating devices (any N.O. dry contact device) to one of the fire alarm control panel SLC loops.
  2. The monitor module shall mount in a 4-inch square, 2-1/8 inch deep electrical box.
  3. The IDC zone may be wired for Style D or Style B operation.

**F. Addressable Control Module**

1. Addressable control modules shall be provided to supervise and control the operation of conventional NACs of compatible, 24 VDC powered, polarized audio/visual notification appliances. For fan shutdown and other auxiliary control functions, the control module may be set to operate as a dry contact relay.
2. The control module shall mount in a standard 4-inch square, 2-1/8 inch deep electrical box, or to a surface mounted backbox.
3. The control module NAC may be wired for Style Z or Style Y (Class A/B) with up to 1 amp of inductive A/V signal, or 3 amps of resistive A/V signal operation, or as a dry contact (Form-C) relay. The relay coil shall be magnetically latched to reduce wiring connection requirements, and to insure that 100% of all auxiliary relay or NACs may be energized at the same time on the same pair of wires.
4. Audio/visual power shall be provided by a separate supervised power loop from the main fire alarm control panel or from a supervised, UL listed remote power supply.
5. The control module shall be suitable for pilot duty applications and rated for a minimum of .6 amps at 30 VDC.

**G. Isolator Module**

1. Isolator modules shall be provided to automatically isolate wire-to-wire short circuits on an SLC loop. The isolator module shall limit the number of modules or detectors that may be rendered inoperative by a short circuit fault on the SLC Loop. At least one isolator module shall be provided for each floor or protected zone of the building.
2. If a wire-to-wire short occurs, the isolator module shall automatically open-circuit (disconnect) the SLC loop. When the short circuit condition is corrected, the isolator module shall automatically reconnect the isolated section.
3. The isolator module shall not require any address setting and its operations shall be totally automatic. It shall not be necessary to replace or reset an isolator module after its normal operation.
4. The isolator module shall mount in a standard 4-inch deep electrical box or in a surface mounted backbox. It shall provide a single LED that shall flash to indicate that the isolator is operational and shall illuminate steadily to indicate that a short circuit condition has been detected and isolated.

**H. Fire Protection System Alarm and Supervisory Equipment**

1. Waterflow Switches shall be an integral, mechanical, non-coded, non-accumulative retard type.
2. Waterflow Switches shall have an alarm transmission delay time that is conveniently adjustable from 0 to 60 seconds. Initial settings shall be 30-45 seconds.
3. All waterflow switches, gate valve supervisory switches, post indicator valve supervisory switches, and waterflow alarm gongs (if required) shall be provided and installed by the sprinkler system contractor. The electrical waterflow alarm-signaling appliance (as indicated on drawings) shall be provided and installed by the alarm contractor. The alarm contractor shall make adjustments and final wire terminations.
4. All conduit for the sprinkler switches and alarm-signaling appliance(s) shall be provided and installed by the alarm contractor and shall be weatherproof. Provide 4" square junction box on closest structural wall to device. Flexible conduit shall be provided and installed by the alarm contractor. Wiring and final connection shall be provided by the alarm contractor.
5. Each sprinkler system water supply control valve riser and zone control valve shall be equipped with a supervisory switch.
6. PIV (post indicator valve) or main gate valves shall be equipped with a supervisory switch.
7. The switch shall be mounted so as not to interfere with the normal operation of the valve and adjusted to operate within two revolutions toward the closed position of the valve control, or when the stem has moved no more than one-fifth of the distance from its normal position. The alarm contractor shall verify and coordinate all supervisory switches are adjusted as required.
8. The supervisory switch shall be contained in a weatherproof aluminum housing, which shall provide a 3/4-inch (19 mm) conduit entrance and incorporate the necessary facilities for attachment to the valves.
9. The switch housing shall be finished in red baked enamel.



10. The entire installed assembly shall be tamper proof.
11. Valve supervisory switches under this section shall be provided and installed by sprinkler contractor.
12. Dry pipe sprinkler systems shall be comprised of a control valve tamper switch, a low/high air pressure switch, waterflow shutoff valve and an alarm pressure switch and located as indicated on the drawings.
13. The general contractor shall provide and install weatherproof conduit and cable to all exterior remote sprinkler devices ( ie. PIV, back flow preventor, etc.). All remote sprinkler devices shall be monitored by the fire alarm system. The alarm contractor shall verify with the general contractor locations of such devices prior to installation start. If remote devices are located and are not indicated on FPE drawings, the alarm contractor shall immediately notify the FPE.
14. The electrical contractor shall provide and install 24 VAC tool rental center maintenance room door holder(s). The electrical contractor shall coordinate and provide the make and model required for proper installation (if applicable).
- I. The electrical contractor shall provide and install 24 VAC tool rental center maintenance room door holder(s), transformer, cable and conduit. The electrical contractor shall coordinate and provide the make and model required for proper installation (if applicable).

#### 2.06 OFF PREMISES REPORTING EQUIPMENT

- A. The fire alarm control panel shall be provided with a built-in Digital Alarm Communicator Transmitter (DACT) for reporting alarm, trouble and supervisory conditions to a remote central station using telephone communication lines.
  1. The DACT shall mount within the FACP enclosure.
  2. The DACT shall include a built-in 0-90 second programmable delay.
  3. The DACT shall monitor the telephone lines for trouble.
  4. The DACT shall have a programmable delay for reporting of AC power loss.

### PART 3 EXECUTION

#### 3.01 GENERAL

- A. Installation of the fire alarm system shall be in strict compliance with manufacturer's recommendations. Consult the manufacturers control panel and peripheral equipment installation manuals for all wiring diagrams, schematics, physical equipment sizes, etc. before beginning system installation. Refer to the riser/connection diagram for all specific system installation/ termination/ wiring data.
- B. Fastening and supports of all equipment shall be adequate to support the required load and provide a safety factor of 5.
- C. As indicated on the FPE shop drawings, each system alarm point or zone in the system shall be uniquely labeled on the cover of the device (detector, monitor module, etc.) and within the fire alarm control panel. Names of the system point (s) / zone (s) shall be as defined by or in consultation with the FPE.
- D. All device activation shall be indicated individually on a separate zone in the fire alarm control panel as indicated on the drawings.

#### 3.02 CABLE AND WIRING

- A. The fire alarm control panel shall be connected to a separate dedicated branch circuit, maximum 20 amperes. This circuit shall be labeled at the emergency panel and within the fire alarm control panel enclosure as "FIRE ALARM CIRCUIT CONTROL" and the circuit breaker shall be effectively locked out with an approved, listed breaker lock device provided and installed by electrical contractor. The control panel cabinet shall be grounded securely to the main building ground. Conduit shall enter into the fire alarm control panel only at those areas of the backbox that have factory conduit knockouts.
- B. Provide all line voltage (120 V. max.) and low-voltage (up to 50 VAC/VDC) circuiting in separate conduit. Low-voltage circuiting shall be installed exposed using NEC-FPL rated cable per NEC article 760 unless otherwise noted by local jurisdictional authorities.
- C. Branch wiring from control and monitor modules to controlled and monitored points shall be minimum #16 AWG-CU paired cable (not necessarily twisted) or as per manufacturer's recommendations. Wiring for addressable and data transmission connections shall be minimum #16 AWG-CU, low capacitance, per manufacturer's recommendations. Control panel to annunciator cable shall be one pair RS-485 (communication) and one-pair #14 AWG-CU (24 VDC Power). All cable jackets shall be red in color to readily identify it as fire alarm cable.
- D. All wire terminations shall be stripped, landed, and devices installed by the alarm contractor. The alarm contractor will

provide not less than 12" slack wire at devices and 6'-0" slack wire at the control panel for final termination by alarm contractor.

- E. All field wiring shall be completely supervised. In the event of a primary power failure, disconnected standby battery, removal of any internal modules or any open circuits in the field wiring; an audible and visual trouble signal will be activated until the system and its associated field wiring are restored to normal condition.
- F. The alarm contractor shall provide and install low voltage cable, tie wraps, wire nuts etc., per NEC Article 760 standards and manufacturers requirements.

### 3.03 CONDUITS AND BOXES

- A. All conduit, cabling, junction boxes, and cover plates shall be provided and installed per drawings and specifications.
- B. All exposed cable below the bottom bar joist or other roof structure protruding lower, or other locations where the cable may become exposed and/or damaged, must be within a steel conduit.
- C. All junction boxes shall be labeled as fire alarm system with decal or other approved markings .

### 3.04 END OF LINE RESISTORS

- A. The alarm contractor shall install all end-of-line resistors at the device to ensure circuit reliability per manufacturer's instructions.

### 3.05 IDENTIFICATION

- A. The alarm contractor shall number code conductors appropriately and permanently for identification and servicing of the system. Labeling shall clearly identify the circuit, zone and/or device served.

### 3.06 FINAL SYSTEM ACCEPTANCE

- A. The system will be accepted only after a satisfactory test of the entire system has been accomplished by the installing alarm contractor in the presence of a representative of the local authority having jurisdiction and the Home Depot management. At the completion of the project, full documentation shall be presented to Home Depot management indicating acceptance testing has been approved per NFPA 72 and a Record of Completion per NFPA 72 is provided.
- B. The alarm contractor shall perform a fire alarm system acceptance test in the presence of the FPE. This test is in addition to the tests required by the local authority having jurisdiction for the certificate of occupancy. The tests shall be in accordance with NFPA 72 and shall be performed after the complete installation of all systems (two weeks prior to turnover). The contractor shall notify the FPE ten (10) working days prior to the completion of the installation for scheduling. The contractor shall budget for two (2) consecutive days of testing and have two (2) personnel (involved with the installation) on site, however the contractor shall be responsible to be present until such time that all systems are found acceptable. The contractor shall furnish all personnel, lifts, hand tools and any other equipment needed for testing. The contractor shall be responsible and back charged for all additional costs incurred by the failure to perform the tests on the scheduled date, within the budgeted time (2 consecutive days), and/or retests due to system failure (costs include, but are not limited to travel, lodging, per diem, transportation and labor).
- 1. Final acceptance will require the contractor to deliver (3) three sets to the general contractor and one set to the FPE at time of acceptance test the following:
  - a. Record drawings (as built drawings).
  - b. NFPA 72 (1999) record of completion (1 copy to FPE).
  - c. The alarm contractor, upon completion, shall provide to the general contractor at a minimum: letter of completion indicating the system has been fully tested locally and remotely, signals have been verified to the central station and operation of the system has been fully demonstrated to Home Depot personnel (include names of those who were demonstrated to), users and installation manuals, cut sheets on all alarm devices installed on the premise. The alarm contractor shall receive written sign off from the Home Depot project manager indicating all above have been received.
- C. The alarm contractor shall provide a fully operational and tested fire alarm system, training on the operation and proper use of the installed systems (a minimum of 2 classes shall be provided), including 24 hour phone number for questions and service request to the Home Depot representative, per the specification two (2) weeks prior to turnover.
- D. If the system cannot be 100% completed (ie. construction of the building not complete), the affected devices shall be bypassed by the alarm contractor (resistors placed at each module) as to allow the system to be fully operational two (2) weeks prior to turnover. The affected devices shall be activated immediately upon final construction of the affected area.

- E. The Alarm Contractor shall obtain from The Home Depot management, contact lists for notification purposes in case of system activation. The notification list shall include contact phone numbers, individuals' title, and pass codes. This information shall be transmitted to the central station upon receipt two weeks prior to turnover.
- F. The alarm company central station shall provide uploading and downloading functions to the control panel from the central station. The central station shall provide at a minimum, zone and code program changes at the request of authorized Home Depot management.
- G. Prior to Telgian's on site acceptance test, the alarm contractor shall have completed and be prepared to provide to Telgian during the Telgian acceptance test the following:
  - 1. System shall be complete
  - 2. All devices and components shall be tested and signals verified to the central station
  - 3. NFPA 72 certificate completed
  - 4. Central station notification list provided to the central station
  - 5. Ensure all paperwork is ready to turn over to the general contractor and The Home Depot management as indicated.
    - a. As-built drawings (General Contractor)
    - b. NFPA 72 Record of Completion (General Contractor)
    - c. Installation manuals (General Contractor)
    - d. Users manuals (The Home Depot Management)
    - e. The system shall be demonstrated to The Home Depot Management
    - f. Clearly labeled keys (The Home Depot Management)
  - 6. One set of the close out documents listed above shall be provided in the as-built cabinet.

END OF SECTION

**PART 1 - GENERAL****1.01 GENERAL REQUIREMENTS**

- A. This section of the specifications includes the provision and installation of the security system. The security system contractor and electrical contractors shall include in their bids all monies required to provide a 100% fully functional security system per drawings and specifications. The security system contractor shall be responsible for the installation of the security system. The project architect is responsible for providing to the security system contractor drawings and specifications for bidding and construction.
- B. All labor, as indicated, shall be provided by the electrical contractor and security system (alarm) contractors. The electrical and security system contractors are responsible for contracting and scheduling the work of the security system installation. The security system contractor shall notify the Home Depot project manager of the security system contractor's scheduled date(s) on-site, not less than two (2) weeks in advance.
- C. The security system is a FBO (furnished by owner) program with the security system (alarm) contractor bidding directly to The Home Depot and the electrical contractor is under the general contractor. The alarm contractor is responsible for providing and the installation of low voltage cabling, conduit on the interior of the building, garden center and gated areas. The general contractor is responsible for providing and installing all exterior conduit to remote devices. The electrical contractor is responsible for high voltage wiring (main power) and associated conduit. The electrical contractor shall provide his bid to the general contractor.
- D. The requirements of the Contract Documents, including the General and Supplementary General Condition and Division 1 - General Requirements shall apply to the work of this section.
- E. At the time of bid the electrical and security system contractors shall list all exceptions taken to these specifications, all variances from these specifications and all substitutions of operating capabilities or equipment called for in these Specifications and forward said list to the FPE. Any such exceptions, variances or substitutions that were not listed at the time of bid and are identified in the submittal, shall be grounds for immediate disapproval and at their discretion, may require proof of performance.
- F. The specified Home Depot security supplier, herein referred to as the alarm contractor under this section, shall furnish all security equipment. The general contractor shall coordinate all work as provided for in this section with all other related sections and trades.
1. The Home Depot Fire Protection Engineer, herein referred to as FPE, is Telgian Corporation. The FPE primary contact is Ralph Bless (480) 753-5444. The primary design contact is Brian Scudder (480) 621-5083.
  2. The preferred and only acceptable security alarm installation company to be utilized for this project is:  
  
Telgian Corporation  
Brian Scudder  
33300 5 Mile Road  
Suite 106  
Livonia, MI 48154  
E-mail: [bscudder@telgian.com](mailto:bscudder@telgian.com)  
(480) 621-5083

**1.02 RELATED WORK**

Division 16: Basic materials and methods

**1.03 RESPONSIBILITIES**

- A. This section of the specification includes the provision and installation of the security system. The alarm contractor shall include in his bid all monies required to install a fully functional security system. The alarm contractor shall include in his bid, troubleshooting and replacement of devices found inoperable. The alarm contractor shall include in his bid, testing and retesting if necessary to provide a 100% fully operational system approved by the authority having jurisdiction and Telgian. The alarm contractor shall provide all tools, lifts, materials and labor to install all cable and equipment as necessary.
- B. The alarm contractor shall provide all tools, lifts, materials and labor to pipe and install all conduit and conduit mounting enclosures. This installation shall reflect the FPE drawings as much as practically possible. The alarm contractor shall coordinate with the electrical contractor device placement and requirements for a complete and accurate installation.
- C. The electrical contractor shall provide and install, as necessary, all tools, lifts, materials, labor, cable and conduit for high voltage wiring to the alarm system, power supplies and associated equipment per FPE drawings and specifications.
- D. The alarm contractor shall contact the local police department and building department for any additional requirements or for

permits not indicated on the plans. These requirements shall be identified in his bid. By not identifying any differences, the contractor is not entitled to any additional money.

- E. The alarm contractor shall be licensed in the field of security system installation, where applicable.
- F. The alarm and electrical contractors shall contact Telgian with any comments, exceptions, and/or reservations to the drawings and specification prior to bid. By not identifying any differences prior to bid, the contractor is not entitled to any additional money.
- G. The alarm contractor shall provide a motorized aerial work platform and ladder for use during the entire period of the security system installation. The platform shall be capable of any work elevation inside the building.
- H. All conduit, boxes (unless otherwise indicated), fittings, couplings, connectors, straps, supports, pull strings, bushings etc., shall be provided and installed by the alarm contractor on the interior of the building, garden center and gated areas. The general contractor is responsible for providing and installing all exterior conduit to remote devices. All wiring on the exterior of the building, including but not limited to, the garden center and gated areas shall be rated as weatherproof and installed within weatherproof conduit and junction boxes.
- I. The electrical contractor shall provide and install all line voltage (120 V. max.) circuiting in separate conduit.
- J. System operation, testing, turn over, warranty, compliance and after market service shall be provided by the alarm contractor.
- K. The alarm contractor will provide security equipment as indicated on Telgian drawings and specifications.
- L. The architect will provide approved drawings to the alarm contractor for installation. The alarm contractor shall be responsible for acquiring permit (if applicable). All plan review and permit fees shall be paid by owner.
- M. The alarm contractor shall program the control panel per the FPE drawing and specification. It may be necessary for the alarm contractor to make adjustments to the program. The alarm contractor shall have the capabilities of locally programming the system on-site during the installation from system power up until final Telgian acceptance. The alarm contractor shall include in his bid adequate time to provide additional modifications if necessary.
- N. The alarm contractor shall install, terminate and test the security system until fully operational.
- O. The alarm contractor shall obtain final approval from state and local authorities (if applicable).
- P. The alarm contractor shall provide services necessary to obtain final approval deemed necessary until final approval is obtained by state and local authorities (if applicable).
- Q. The alarm contractor shall provide a professionally operated guard service, if system is not complete two (2) weeks prior to turnover, tested and approved by the Authority Having Jurisdiction (if required). The guard service shall be provided until such systems are found acceptable and approved by Telgian and/or The Home Depot and the Authority Having Jurisdiction (if required). The alarm contractor shall be responsible for all costs incurred by not meeting these requirements.
- R. The alarm contractor shall coordinate all work necessary with all trades to provide a fully functional system, two (2) weeks prior to turnover. If the alarm contractor does not receive support from trades necessary to meet this requirement, the alarm contractor shall be responsible for notifying the Home Depot project manager, general contractor and Telgian in writing.
- S. The security system must be complete prior to the acceptance test date. The alarm contractor will be responsible for all travel costs, and other related expenses, should the associated work of the alarm contractor not be complete at the time of the scheduled on-site acceptance test date. The alarm contractor shall also be responsible for reimbursements of cancellation charges incurred by Telgian if advance travel plans must be altered after test is scheduled. The alarm contractor shall be back charged for all costs incurred.
- T. A written report shall be prepared by Telgian and submitted to the Home Depot representative at the completion of the project, prior to turn over. This report shall outline the acceptance test results and identify any items not completed or fully operable. The installing contractor must correct any item that is identified in this report and the system must be fully operable prior to turn over.
- U. The alarm contractor shall provide the FPE with address, name, phone number and e-mail address of those individuals directly responsible for the installation of the security system.
- V. If this store is undergoing a remodel, which will affect the installation. The alarm systems must be functional every night, with no loss of protection. The remodel schedule must be strictly adhered to for facilitation of wiring areas during demolition, before finished construction. New areas where devices must be installed shall be scheduled as to allow no loss of protection.

1. The store may not be left unprotected after hours. If the facility's security system cannot be utilized the installing contractor

- shall be responsible to provide a professionally operated guard service at their cost.
- 2. Equipment present in the store that shall not be activated on the new system shall be removed.
- 3. All wiring to be abandoned shall be removed.
- 4. A blank cover plate shall replace each abandoned device, or the wall shall be repaired (drywall).
- W. At the end of each workday, during the install, the installing contractor shall clean up all debris, fingerprints, dust from drilling, etc. Any work not completed shall be left in a manner that will not affect any other operation.
- X. The installing contractor shall perform a pre-installation teleconference, with the Telgian project supervisor, prior to start of project. The installing contractor shall respond to the in-progress status reports, at critical milestones, via email, as dictated by Telgian.
- Y. The installing contractor shall attend weekly construction meetings on site, as indicated by the general contractor or by the THD project manager.
- Z. The installing contractor shall coordinate the installation of conduit with the electrical contractor for exact locations and scheduling.

#### 1.04 SYSTEM DESCRIPTION

- A. The security system shall provide the following features:
  - 1. Overall building and garden center perimeter protection with daytime annunciation (when required by The Home Depot management) of all fire exit doors, roof hatch, telephone room door, shipping/receiving doors, entry and exit doors, cash pick-up door and fence gates.
  - 2. The interior motion detection shall be on a separate area; motion detectors to be located at all glass areas, shipping dock, tool rental, and office area and as indicated on Telgian drawings.
  - 3. The vault area/safe protection shall be on a separate area and interlocked with perimeter protection so that the perimeter cannot be armed without first arming the vault area. This area of protection consists of vault area door, contact protection of safe, vault, and area motion detector.
  - 4. The receiving area shall be on a separate area. Area of protection consists of driver man, overhead receiving doors and receiving motion.
  - 5. The compactor door shall be on its own area with the alarm command center adjacent to the door.
  - 6. Provide manual overrides in the security system alarm programming that allow manual override of interlocks described above. The intent of the interlocks is to provide notification of unarmed zones or locations prior to exiting the building, but at the same time to have provisions for manually overriding a point if the store is occupied in one area while still desiring perimeter protection or protection in another area.
  - 7. Hold up alarm with activation buttons located in the vault room (if applicable).
  - 8. Provide a keypad at a central location as indicated on Telgian drawings for each alarm area that is capable of performing all features herein described.
  - 9. Energy management system (lighting control) connection via dry contacts.
    - a. The dry contacts will be located in a box adjacent to the security panel. The N.C. contact will open when the perimeter and interior areas are armed simultaneously. The contacts shall close upon deactivation or when an alarm condition occurs. The alarm contractor shall test and verify the contact operation with a multimeter prior to the energy management company's arrival at building possession date.

#### 1.05 QUALITY ASSURANCE

- A. Manufacturer
  - 1. Equipment shall be supplied by the alarm contractor.
- B. Equipment Handling
  - 1. The alarm contractor shall provide equipment in durable shipping cartons.
  - 2. The alarm contractor is responsible for receiving the system at the site or predetermined location and to review order for completeness, inspect all cartons for damage and correct labeling. Once received the alarm contractor shall take full responsibility for the storage and protection of all materials.

3. The alarm contractor shall replace at their cost any equipment lost or damaged after receipt. Replacement equipment shall be of the same manufacturer make and model as indicated on Telgian drawings.

C. Warranty

1. The alarm contractor shall warranty the system for a period of 1 year from grand opening. The alarm contractor shall replace all warrantied equipment (labor and equipment) within the warrantied period at no cost if equipment has failed due to manufacturers' equipment failure.
2. The warranty shall include:
  - a. All equipment provided by the alarm contractor.
  - b. Labor to replace all equipment provided by the alarm contractor.
  - c. Cable provided and installed by the alarm contractor.
  - d. Connectors provided and installed by the alarm contractor.
  - e. Supporting hardware provided and installed by the alarm contractor.
  - f. The alarm contractor shall guarantee all wiring and raceways to be free from inherent mechanical or system defects.
3. The alarm contractor shall include in the warranty, replacement and/or purchasing of equipment provided by the alarm contractor. The alarm contractor shall not invoice The Home Depot for any equipment or labor found defective due to equipment or labor failure within the warranty period.
4. Alarm contractor is required to include all labor required to perform warranty work during warranty period.
  - a. This warranty work will include replacement of warranty components, ordering warranty components, installing or reinstalling warranty components and all management and labor required to satisfy warranty issues.
5. The alarm contractor shall include the warranty, replacement and/or purchasing of equipment or labor provided by the alarm contractor. The alarm contractor shall not invoice The Home Depot for any equipment or labor found defective due to equipment or labor failure within the warranty period.

PART 2 - PRODUCTS

1.06 GENERAL

The security system specified herein shall include a Digital Alarm Communicator Transmitter (DACT), built-in telephone line monitor, up to 1000 event memory logger, real time clock, calendar, test timer, battery charging / voltage supervision circuitry, battery lead supervision, diagnostics displays, time / event based scheduling system, lightning / EMI protection circuits and the associated optional modules and components for a complete security system.

The DACT firmware shall support programmable "software" features as detailed in section 1.07 SYSTEM FEATURES/CAPABILITY SUMMARY. The following describes the general functional requirements of the security system:

- A. The security system shall support the connection and reporting of intrusion, detection devices to a remote Digital Alarm Communicator Receiver (DACR).
- B. The security system shall provide identification, annunciation and communication of alarmed detectors by point.
- C. The security system shall be capable of segregating the points (i.e. a detector or group of detectors zoned together) into separate independent "areas".
- D. The security system shall be "modularly" expandable using hard-wired address identification modules.
- E. The security system shall have electrically supervised detection loops and power supplies (mains and battery(s)). This supervision shall be programmable for the purposes of reporting this information to the DACR.
- F. The security system shall be capable of monitoring and switching to activate telephone lines when trying to establish communications with the DACR and transmitting a report.
- G. The security system shall be capable of reporting and communicating alarm or trouble event data by reporting to one, two or three off-site remote receiving / monitoring locations via (DACRs) dial-up analog telephone lines or over a local or wide area network using a network interface module in the event of loss of telephone lines.
- H. The security system shall be capable of sending (manually or automatically) test and status reports to DACRs.
- I. The security system shall be programmable locally or remotely. Programming shall be accomplished via a portable programmer or a computer running the Remote Programming Software (RPS). Users shall be capable of changing their own user pass code

from the Alarm Command Center (ACC) and managers shall be capable of changing the user pass codes and authority assignments by area of other users from the ACC.

- J. The security system shall annunciate alarm, trouble, service reminders and other relevant system status messages in custom English text at the ACC.
- K. The security system shall be capable of executing diagnostics and testing functions locally or remotely.
- L. The security system shall be capable of activating 128 relays and 3 additional outputs for auxiliary functions based on its classifications (area vs. panel wide).
- M. The security system shall be capable of controlling relays and automatically executing system functions based on a time / event scheduling program. The program can be hour, day of week or day of month based. Each scheduled event can be exclusive of one of four holiday date definitions that can include on to 365 selected Julian dates. The following functions can be executed:
  - 1. Arm / Disarm a specific area
  - 2. Bypass / Unbypass a point
  - 3. Activate / Deactivate a relay
  - 4. Send a test report
  - 5. Adjust system clock for daylight savings time
  - 6. Turn an Access Authority Level On / Off
  - 7. Hold a Door Open (unlocked and shunted)
  - 8. Secure a Door Closed (locked, no valid cards will allow entry)
  - 9. Return a Door to Normal Operation (locked, valid cards will allow entry)
  - 10. Turn recording of Access Granted events On / Off (and transmittal if routing is ON)
  - 11. Turn recording of Access Denied events On / Off (and transmittal if routing is ON)
- O. The security system shall be capable of listening to calls answered by other devices on the premises side of the phone line and determining if a special tone is being sent from the incoming call (Remote Account Manager) and intercepting the call for Remote Account Manager Sessions.
- P. The security system shall be capable of controlling up to eight separate doors using and providing entry to authorized users based on authority assigned to the user by the area into which the door enters. The security system shall use not less than 24 bits of card/token specific data to identify the user. This card data shall not be truncated or shortened in making the identification of the user.

#### 1.07 SYSTEM FEATURE / CAPABILITY SUMMARY

The following indicates system software / hardware capabilities, capacities and formats:

- A. Number of Loops/Sensors: 246 separately identifiable points, of which 8 are on-board loops and 238 are off board addressable points / zones connected to multiplexed backbone trunks. Each of the points shall be capable of supporting "group zoning". Group zoning refers to the combining of sensors into a separately identifiable and separately annunciated (programmable text) area.
- B. Programming Point Functionality: Each point in the system shall provide for the following type of response in the system.
  - 1. Always on (24 hour response)
  - 2. On when the system is Master Armed
  - 3. Only on when the system is Perimeter Armed
  - 4. Displays / Does Not Display at the ACC when the point is activated
  - 5. Provides / Does Not Provide entry warning tone
  - 6. Sounds / Does Not Sound audible alarm indication
  - 7. The Point is bypassable / not bypassable
  - 8. Alarm Verification with programmable verification time
  - 9. Relay activation by Point
  - 10. Provides / Does Not Provide "watch point" capability
  - 11. Provides Swinger Bypass
  - 12. Defers Bypass Report
  - 13. Can return to the system after being force armed and then restoring
  - 14. Can return to the system after being bypassed and then restoring
- C. Areas / Accounts: The security system shall support 8 independent areas. Each of the eight (8) areas shall have custom text associated with the armed state, disarmed state and point-off-normal state. Additionally, the security system shall be capable of assigning 1 to 8 account identifiers to the areas depending on the distribution of areas per account. Each and all of the eight areas must be capable of Master and /or Perimeter arming (excluding predefined Interior protection). The security system shall be capable of logically grouping 2 or more points into an area, or conversely, dividing the points into two or more areas.

Any area shall be configurable to allow arming by specific user when a programmable number of devices are faulted or



bypassed.

Areas shall be independently controlled by their corresponding ACC. Each ACC can be designated to control a specific area, or group of areas, or all areas in the system.

- D. Number of Alarm command Centers: 32 Unsupervised ACCs, each capable of displaying custom English text on vacuum fluorescent displays and sounding different patterns of audible alarm for different events, shall be required. Up to eight (8) ACCs can be supervised at one time. An ACC can be programmed to respond to the entry of any of the specifically authorized 250 user pass codes (followed by the [ENT] key) and cycle an assigned access control door using a connected door controller. The event is logged and transmitted (if routing is ON) to the DACR including door and user identity.
- E. Number of User Passcodes: Up to 249 different passcodes shall be required. Each passcode shall be three (3) to six (6) digits (variable) and be assigned a 16-character user name that shall be printed on the DACR with associated opening and closing reports from the user. Passcodes shall be enabled or disabled by area(s) and shall be assigned one of fourteen (14) different authority levels to carry out functions such as the activation of relays from the ACC. These passcodes shall also be required for carrying various system functions such as arming the system, disarming the system, transmitting a duress code, resetting the system and silencing sounders. A single user passcode shall be able to be used in each of the 8 areas with potentially a different authority level in each area.
- F. Each of the 249 different passcodes shall be able to be associated with 4 individual access cards/tokens. The authority of any of the four cards assigned to the user will be that of the user, but each card will report in the display, memory event log and at the DACR as a separate user/ sub-user number pair.
- G. Number of Access Controlled Doors: Up to 8 doors, each connected to a door controller module that is subsequently connected to the security system. Each door controller is programmed through the security system from the local programmer or the RPS and can be configured independently from other doors. Each door contact is supervised and is wired to the door controller and can use normally open or normally closed contacts. The door lock can be programmed to reset the door strike time when the door either opens or closes. The door opening can terminate a programmable door buzzer. The door contact is shunted when valid access is being granted through the door. A request to exit and a separate request to enter supervised input is provided on the door controller. A programmable feature provides for door shunting on request to exit without activating the lock output. An optional buzzer can be sounded and an ACC can display a door closing warning if the door is held open beyond a programmable time. The door can be programmed to activate an alarm or trouble in the door left open condition. The DACT shall be capable of transmitting the Door Left Open indication to the DACR. The door strike shall be capable of being programmed to automatically unlock if the area is completely disarmed and will not automatically unlock if the area is selectively disarmed. The security system shall be capable of being programmed, on a time basis, to record access granted and or access denied events by door.
- H. Access Control / User Features: The security system shall allow each authority profile to specify whether users holding that authority are to be granted access into the area based on whether the area is completely disarmed, perimeter armed or completely armed. Additionally, the security system shall be able to automatically disarm the area or convert the arm state of the area from fully armed to perimeter armed based on the authority level assigned to the user and area. Assigned users shall be able to manually control the door from an ACC by setting the door to Normal Operation, Manually Locked or Secured (valid cards will not operate).
- I. Communication Formats: The Radionics Modem IIIa2 communications format shall be utilized for optimum system performance. The DACT shall report to a Commercial Central Station using a Bosch Security system D6500 or D6600 alarm Receiver that supports the Radionics Modem IIIa2 communications format. One such advantage is point identification information transmission to DACRs (Alarms, Troubles and Restorals by point). Others include actual point number; point opening/closing reports, and opening/closing reports by area.
- J. Testing, Diagnostic, and Programming Facilities: Automatic test reports and remote system access for diagnostics, programming, and log (Logger) uploads shall also be supported via a remote central station computer utilizing the RPS software.
- K. Logger Capacities and Formats: Up to 1000 events indicating time, date, type of event, account number, area number, user ID, point text, user text and primary/secondary event route each event. Logs shall be viewed locally at the ACC and remotely via an upload to a computer running the RPS software. The security system shall also send a report to the DACR when the log reaches a programmable "percent full capacity" so that RPS can retrieve the stored events.
- L. Reports: Reports to DACRs at commercial central stations as a result of system supervision shall include alarm, trouble, missing modules, restoral, system status, AC failure and low battery. The security system shall also transmit test reports once every 24 hours. CPU failure shall be annunciated locally. The ACCs should display the following information of the indicated system supervisory conditions:
  - 1. Call for service
  - 2. Service Panel
  - 3. Service Param
  - 4. Service AC Fail

5. Service Battery Low
  6. Service Battery Missing
  7. Service Communications Failure
  8. Service Keypad
  9. Service Route
  10. Service Point Buss Failure
- M. Telephone Lines, IP Addresses, and "Phone Routing". The security system shall support one (1) or tow (2) telephone lines that are to be alternated for the transmission of consecutive events. The security system shall have the capability of communicating with up to eight (8) different DACRs (4 different phone numbers) and/or four (4) different IP Addresses. Each phone number can be up to 24 digits long. The security system reports shall be classified, by event, into eleven (11) subcategories or "report groups". Each group represents similar types of events. Individual events within each group shall be selectively enable or disable to be transmitted. Each DACR shall be designated as a primary, backup, or duplicate destination for each report group. Assigning an event to multiple routing groups provides for duplicate destination for the event. The transmission of events allows the reporting of different types of information to different remote DACRs. The eleven report groups shall be as follows:
1. Fire Reports
  2. Burglar Reports
  3. User Reports
  4. Test Reports
  5. Diagnostic Reports
  6. Relay Reports
  7. Auto Function Reports
  8. RAM (RPS) Reports
  9. Point Reports
  10. User Change Reports
  11. Access Reports
- N. Number of Programmable Relay Output Modules: 8 relays (form C) are to be provided per octo-relay module for a total of 128 relays plus three additional outputs per security system. These multi-purpose modules are programmable and shall be used to implement auxiliary functions (manually or automatically). There are up to 128 outputs available on the B9512G for the relay follows point function.
- O. Number and Alarm Output Selections: Four (4) different types of alarm output selections shall be supported by the security system: Steady, Pulsed, California Standard, and Temporal Code 3.
- P. Miscellaneous Features: Programmable alarm output time, 31 programmable entry delay times, exit delay programmable by area, individually programmable point of protection text, pint bypassing, and keyswitch arming capability with LED outputs.
- Q. Real-Time Clock, Calendar, and Test Timer: The security system shall incorporate an integral real-time clock, calendar and a test timer.
- R. Opening and Closing Windows: The system shall be programmed with "normal" opening and closing periods for each day of the week and thus suppress scheduled opening / closing reports and report only the exceptions, i.e., opening / closing outside the pre-defined time window. The security system shall have the capability to suppress opening / closing reports, overriding the programmed open / close windows during holidays and automatically arming the security system (by area) at the end of the closing period.
- S. Security System Power Ratings: The security system shall provide 1.4 amps of auxiliary power and 2 amps of alarm power, both rated at 12 VDC.
- T. Security system Fault Detection: The security system shall check the point sensor loops once every 300 milliseconds. The point response time is programmable over a range of 300 milliseconds to 4.5 seconds.
- U. User-Programmable Features: The security system shall provide a menu driven interface to provide a user-friendly command structure for programming / customizing the system to the operational criteria of the application. The security system shall be capable of being operated via:

1. The Command Structure
2. Menu / Command List

**1.08 SYSTEM INTERFACE REQUIREMENTS**

- A. Grounding: The Contractor shall properly earth ground the DACS to prevent electrostatic charges and other transient electrical surges from damaging the DACS panel.
- B. Primary power: The Electrical Contractor shall provide a dedicated 120 VAC power circuit to the DACS system. This circuit shall be connected to the emergency power system. The 120 VAC is stepped down to 16.5 VAC to power the DACS panel using a class two, plug-in transformer. This power circuit shall be properly rated to continuously power all points and functions indefinitely in full alarm condition.
- C. Primary power supervision: When the primary power source fails, the system can be configured to report an "AC Fail" message to a commercial central station. The transmission delay of this message is programmable from 5 seconds to 86 minutes with an optional 6 to 12 hour transmission delay. The message can also be programmed to "tag-along" with another message transmitted to the central station. The system will always display a loss of primary power on the ACC and may be configured to provide additional audible warning.
- D. Secondary power (standby battery): The Contractor shall provide adequate battery power as defined by the relevant application criteria, (UL 864 and 985 for alarm installations or NFPA 72 chapters for fire applications). Appropriate battery chargers shall be provided consistent with the battery back-up capacity. The most current accepted version of NFPA 72 and any applicable local codes or AHJ requirements must be met accordingly.
- E. Secondary power supervision: When the secondary power source experiences a 85% depletion of its standby capacity, the system can be configured to report a "Low Battery" message to a commercial central station. The system will always display a low battery condition on the ACC and may be configured to provide additional audible warning.
- F. Wiring: The contractor shall provide cables consistent with the manufacturer's recommendations. The following general guidelines shall be followed for wiring installation:
  1. Wiring shall be appropriately color-coded with permanent wire markers. Copper conductors shall be used.
  2. All signal cables provided under this contract shall be Class II, plenum-rated cable where required. Refer to Telgian drawings for specific requirements. Where subject to mechanical damage, wiring shall be enclosed in metal conduits or surface metallic raceway.
  3. Data wires shall not be enclosed in conduit or raceways containing AC power wires.
  4. Where EMI may interfere with the proper operation of the DACS circuits, twisted/shielded cable shall be used.
- G. The DACS shall be protected from EMI and lightning surges.
- H. Telephone interface: The DACS shall be equipped with a phone line monitor and shall interface with the phone lines via RJ-31X jacks for supervision of the telephone line connection to the DACS panel. When a telephone line is determined to be out of service by the DACS panel, the event will be annunciated locally on the ACC and transmitted to the central station. The transmission delay of this message is programmable from ten (10) to two-hundred forty (240) seconds. A telephone line switching modules shall be used to interface to a second telephone line. This interface shall conform with FCC rules part 15 and 68.
- I. Ethernet access: The DACS may use an Ethernet interface module as the primary means of communicating to a DACR. Up to four IP Addresses shall be available to route system events to. A programmable supervision time of 5 to 65,535 seconds shall be required.
- J. Auxiliary function control interfaces: Auxiliary functions such as activating bells, strobes, or lights shall be accomplished using the optional relay modules. These auxiliary interfaces shall be electrically isolated to avoid inter-system interferences or damages.
- K. Functional criteria programmed into system memory shall be backed up by battery power. Additionally, the number of system programmers shall be severely restricted via the use of program locking features and passwords.

**1.09 MATERIALS**

- A. Security system components / accessories: The alarm contractor shall provide and the alarm contractor shall install all the necessary equipment and devices required to implement the functions herein described for an operational security system; the following list is not all inclusive but only serves as a basis for the system.
1. Main security alarm control panel, CPU, etc.
  2. Security system alarm command / control centers, keypads, printer
  3. Lock and keys
  4. Alarm modules
  5. Alarm contacts, door switches, intrusion switches, motion sensors, infrared sensors, etc. per application. Garden center motion sensors shall be "dual technology" suitable for outdoor use. (If applicable)
  6. Telephone line modules, police department / monitoring service tie-in
  7. Annunciation module
  8. Horns, bells, strobes, sirens etc.
  9. Relay modules, plug-in relays
  10. Zone control modules
  11. Zone control keypads
  12. Communications modules
  13. Power supplies, batteries, transformers and accessories
- B. Any additional equipment not indicated on Telgian drawings and added by state and local authorities shall be immediately reported to Telgian. The alarm contractor will provide additional equipment deemed necessary, unless otherwise directed by Telgian personnel. Any deviations shall be grounds for disapproval of payment.

**PART 3 EXECUTION****1.10 GENERAL**

- A. Installation of the security system shall be in strict compliance with manufacturer's recommendations. Consult the manufacturers control panel and peripheral equipment installation manuals for all wiring diagrams, schematics, physical equipment sizes, etc. before beginning system installation. Refer to the riser/connection diagram for all specific system installation/ termination/ wiring data.
- B. Fastening and supports of all equipment shall be adequate to support the required load and provide a safety factor of five.
- C. As indicated on the Telgian drawings, each system alarm point or zone in the system shall be uniquely labeled.

**1.11 CABLE AND WIRING**

- A. All field wiring shall be completely supervised. The contractor shall provide cables consistent with the manufacturer's recommendations. The following general guidelines shall be followed for wiring installations:
1. Number code and color code conductors appropriately and permanently for identification and servicing of the system. Labeling shall clearly identify the circuit, zone and / or device served. Copper conductors shall be used.
  2. All signal cables provided under this contract shall be Class II, plenum rated cable where required. Refer to Telgian drawings for specific requirements. Where subject to mechanical damage, wiring shall be enclosed in metal conduits or surface metallic raceway.
  3. Data wires shall not be enclosed in conduit or raceways containing AC power wires.
  4. Where EMI may interfere with the proper operation of the security system circuits, twisted / shielded cable shall be used.
- B. The security system control panel shall be connected to a separate dedicated branch circuit, maximum 20 amperes. This circuit shall be labeled at the emergency panel and within the security system control panel enclosure as SECURITY SYSTEM and the circuit breaker shall be effectively locked out with an approved, listed breaker lock device provided and installed by electrical contractor. The control panel cabinet shall be grounded securely to the main building ground. Conduit shall enter into the security system control panel only at those areas of the backbox that have factory conduit knockouts.
- C. Provide all line voltage (120 V. max.) and low-voltage (up to 50 VAC/VDC) circuiting in separate conduit.
- D. Branch wiring from monitor modules to controlled and monitored points shall be twisted paired cable. Wiring for addressable and data transmission connections shall low capacitance, twisted pair. Control panel to keypad cable shall be two pair one pair data (communication) twisted and one-pair twisted (12 VDC Power). Refer to Telgian drawings for specific requirements.

- E. All wire terminations shall be stripped, landed and devices installed by the alarm contractor. The alarm contractor will provide not less than 12" slack wire at devices and 6'-0" slack wire at the control panel for final termination by alarm contractor.
- F. All field wiring shall be completely supervised by alarm contractor. In the event of a primary power failure, disconnected standby battery, removal of any internal modules or any open circuits in the field wiring; an audible and visual trouble signal will be activated until the system and its associated field wiring are restored to normal condition.
- G. The alarm contractor shall provide and install low voltage cable, tie wraps, wire nuts and D-rings (if required) per NEC Article 760 standards and manufacturers instructions.
- H. The alarm contractor shall provide wire clamps within 6" (at a minimum) from security system devices i.e. door contacts, motion detectors etc.

**1.12 CONDUITS AND BOXES**

- A. Conduit shall be provided and installed by the alarm contractor on the interior of the building, garden center and gated areas. The general contractor is responsible for providing and installing all exterior conduit to remote devices.
- B. All exposed cable below the bottom bar joist or other roof structure protruding lower, or other locations where the cable may become exposed and/or damaged, must be within a steel conduit.
- C. The alarm contractor shall provide and install all junction boxes and cover plates per manufacturers instructions and details. The alarm contractor shall label all electrical junction boxes as "security system" with decal or other approved markings including the devices annunciation description and point number.
- D. All conduit requirements shall be provided by the alarm contractor. Where possible all conduit shall be concealed in ceiling space, partition walls or poured walls (where approved by structural engineer).

**1.13 END OF LINE RESISTORS**

- A. The alarm contractor shall install all end-of-line resistors at the device to ensure circuit integrity per manufacturer's instructions.

**1.14 IDENTIFICATION**

- A. The Alarm Contractor shall number code conductors appropriately and permanently for identification and servicing of the system. Labeling shall clearly identify the circuit, zone and/or device served.

**1.15 FINAL SYSTEM ACCEPTANCE**

- A. The alarm contractor shall install, terminate and test the systems until fully operational, including verification of receipt of all signals to the central station, per the specification.
- B. The alarm contractor shall provide a fully operational security system, training on the operation and proper use of the installed systems (a minimum of 2 classes shall be provided), including 24 hour phone numbers for questions and service requests, to The Home Depot representative, per the specification two (2) weeks prior to turnover. The alarm contractor shall receive written documentation from The Home Depot Management that the demonstration has been completed.
- C. The system will be accepted only after a satisfactory test of the entire system has been accomplished by the installing alarm contractor in the presence of a representative of Telgian and / or The Home Depot management.
- D. The alarm contractor shall perform a system acceptance test in the presence of Telgian two (2) weeks prior to turnover. This test is in addition to any tests required by the local authority having jurisdiction for the Certificate of Occupancy. The contractor shall notify Telgian ten (10) working days prior to the completion of the installation for scheduling. The contractor shall budget for two (2) consecutive days of testing, however the contractor shall be responsible to be present until such time that all systems are found acceptable. The contractor shall furnish all personnel (2 technicians, involved with the installation), lifts, hand tools, radios and any other equipment needed for testing. The contractor shall be responsible and back charged for all additional costs incurred by the failure to perform the tests on the scheduled date, within the budgeted time (2 consecutive days), and/or retests due to system failure (costs include, but are not limited to travel, lodging, per diem, transportation and labor).
- E. If the system cannot be 100% completed (ie. construction of the building not complete), the affected devices shall be bypassed by the alarm contractor (resistors placed at each module) as to allow the system to be fully operational two weeks prior to turnover. The affected devices shall be activated immediately upon final construction of the affected area by alarm contractor.
- F. The Alarm Contractor shall obtain from The Home Depot Management, contact lists for notification purposes in case of system activation. The notification list shall include contact phone numbers, individuals title, pass codes and pass code access levels. This information shall be transmitted to the Central Station upon receipt, two weeks prior to turnover.

- G. The alarm company central station shall provide uploading and downloading functions to the control panel from the central station. The central station shall provide at a minimum, zone and code program changes at the request of authorized Home Depot management.
- H. The alarm contractor, upon completion, shall provide (3) sets to the Home Depot Project Manager and one set to Telgian at a minimum: As-built drawings, letter of completion indicating the system has been fully tested locally and remotely, signals have been verified to the central station and operation of the system has been fully demonstrated to Home Depot personnel (include names of those who were demonstrated to), users and installation manuals and cut sheets on all alarm devices installed on the premise. The alarm contractor shall receive written sign off from the Home Depot Project Manager indicating all of the above have been received.
- I. Prior to Telgian's on site acceptance test, the alarm contractor shall have completed and be prepared to provide to Telgian during the Telgian acceptance test the following:
  - 1. System shall be complete
  - 2. All devices and components shall be tested and signals verified to the central station
  - 3. Central station notification list provided to the central station
  - 4. Ensure all paperwork is ready to turn over to the general contractor and The Home Depot Management as indicated.
    - a. As-built drawings (General Contractor)
    - b. Installation manuals (General Contractor)
    - c. Users manuals ( The Home Depot Management)
    - d. The system shall be demonstrated to The Home Depot Management
    - e. Clearly labeled keys (The Home Depot Management)
    - f. Close-out documentation – equipment cut sheets, user and installation manuals and warranty information (General Contractor).
    - g. One set of the close-out documents shall be provided in the as-built cabinet.

**1.16 WARRANTY**

- A. The alarm contractor shall guarantee all wiring and raceways to be free from inherent mechanical or system defects for one (1) year from date of grand opening.
- B. Alarm contractor is required to include all labor required to perform warranty work during warranty period.
  - 1. This warranty work will include replacement of warranty components, ordering warranty components, installing or reinstalling warranty components and all management and labor required to satisfy warranty issues.
  - 2. Components in the above paragraph refer to security equipment supplied by the FPS.

END OF SECTION

**PART 1 - GENERAL****1.01 SUMMARY**

- A. Furnish and install a complete UL listed system of specified heater, components, and controls listed specifically for keeping roof eaves, gutters, and downspouts from being clogged by ice and snow.

**PART 2 - PRODUCTS****2.01 HEATING CABLE**

- A. The self-regulating heater shall consist of two (2) 16 AWG nickel-coated copper bus wires embedded in a self-regulating polymer core that varies its power output to respond to temperature all along its length, allowing the heater to be crossed over itself without overheating, to be used with wood, plastic, and asphalt building materials, and to be cut to length in the field.
- B. For energy conservation, the self-regulating heating cable shall have a power output of 12 watts per foot where it contacts ice and snow and 5 watts per foot in air. The heater shall be covered by a radiation cross-linked modified polyolefin dielectric jacket and protected by a tinned-copper braid and a polyolefin outer jacket.
- C. The heating cables shall operate on 208 volts without the use of transformers.
- D. The heating cables shall be IceStop GM-2XT cables manufactured by Raychem Corporation.
- E. Lengths of cables shown on the drawings are maximum lengths for 30A, branch circuits. Extra length over and above specific gutter requirements shall be overlapped in the gutter, rather than be cut to the exact length.

**2.02 CONNECTION SYSTEM**

- A. Power connection, end seal, splice, outer jacket repair, and gutter and roof insulation clip kits shall be furnished and applied in the field.
- B. Snow/Ice sensors and associated control panel shall be as manufactured by Environmental Technology, Inc., South Bend, IN 46601, (800) 234-4239.

**2.03 CONTACTOR**

- A. The contactor will be multi-pole contactor with an ampere rating as noted on drawings. (Furnished by others.)

**2.04 BRANCH CIRCUITS**

- A. Shall be protected by ground fault circuit breakers with a 30 milliamp trip. (Furnished by others.)

**PART 3 - EXECUTION****3.01 INSTALLATION**

- A. The heating cables shall be laid in gutters, suspended in downspouts either as a loop or as a single length and held in place by a hanger kit; and shall be attached to roofs using roof clip kits.
- B. Protect the heating cables from damage and install according to manufacturer's instructions.

**3.02 TESTS**

- A. After installation, test the dielectric jacket's insulation resistance and continuity. Insulation resistance from the conductors to the shield shall be greater than 1000 megohms.

**END OF SECTION**