# Greenville, NC
# Footwear Remodel 2024
# SPECIFICATION
## SINGLE LEVEL

**Store #1066**

Onyx Creative
25001 Emery Rd. Suite 400
Cleveland, OH 44128

**DATE:**

April 19, 2024

THIS PAGE IS BLANK

**TABLE OF CONTENTS**


**DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS**

00 0101 PROJECT TITLE PAGE
00 0110 TABLE OF CONTENTS
00 2113 INSTRUCTIONS TO BIDDERS
00 4100 BID FORM
00 4322 UNIT PRICES FORM
00 4327 SEPARATE PRICES BREAK-OUT FORM
00 4328 BID COST WORKSHEET
00 7100 CONTRACTING DEFINITIONS
00 7200 GENERAL CONDITIONS
00 7300 SUPPLEMENTARY CONDITIONS
00 9500 SPECIAL CONDITIONS

**DIVISION 01 - GENERAL REQUIREMENTS**

01 1000 SUMMARY
01 2500 SUBSTITUTION PROCEDURES
01 2550 SUBSTITUTION REQUEST FORM
01 3000 ADMINISTRATIVE REQUIREMENTS
01 4000 QUALITY REQUIREMENTS
01 5000 TEMPORARY FACILITIES AND CONTROLS
01 7000 EXECUTION AND CLOSEOUT REQUIREMENTS

**DIVISION 02 - EXISTING CONDITIONS**

02 4100 DEMOLITION

**DIVISION 03 - CONCRETE**

03 2000 CONCRETE REINFORCING
03 3511 CONCRETE FLOOR FINISHES
03 5400 SELF-LEVELING UNDERLAYMENT

**DIVISION 04 - MASONRY**

Not Used

**DIVISION 05 - METALS**

05 4000 COLD-FORMED METAL FRAMING
05 5000 METAL FABRICATIONS

**DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES**

06 1000 ROUGH CARPENTRY
06 2000 FINISH CARPENTRY
06 6710 MOLDED POLYMER FABRICATIONS
06 8316 FIBERGLASS REINFORCED PANELING

**DIVISION 07 - THERMAL AND MOISTURE PROTECTION**

07 6200 SHEET METAL FLASHING AND TRIM
07 8400 FIRESTOPPING
07 9200 JOINT SEALANTS

**DIVISION 08 - OPENINGS**

08 1113 HOLLOW METAL DOORS AND FRAMES
08 1416 FLUSH WOOD DOORS
08 3100 ACCESS DOORS AND PANELS
08 7100 DOOR HARDWARE

**DIVISION 09 - FINISHES**

09 2116 GYPSUM BOARD ASSEMBLIES
09 3000 TILING
09 5100 ACOUSTICAL CEILINGS
09 6500 RESILIENT FLOORING
09 6813 TILE CARPETING
09 6816 SHEET CARPETING
09 9000 PAINTING AND COATING

**DIVISION 10 - SPECIALTIES**

10 1600 PHOTO MURALS
10 2600 WALL AND DOOR PROTECTION
10 4400 FIRE PROTECTION SPECIALTIES

**DIVISION 11 - EQUIPMENT**

Not Used

**DIVISION 14 - CONVEYING EQUIPMENT**

Not Used

**DIVISION 21 - FIRE SUPPRESSION**

21 1000 FIRE PROTECTION

**DIVISION 22 - PLUMBING**

Not Used

**DIVISION 23 - HEATING, VENTILATING, AND AIR-CONDITIONING (HVAC)**

23 0100 BASIC MECHANICAL REQUIREMENTS
23 0553 IDENTIFICATION FOR HVAC EQUIPMENT
23 0593 TESTING, ADJUSTING, AND BALANCING FOR HVAC
23 0713 DUCT INSULATION
23 3100 DUCTWORK
23 3300 DUCTWORK ACCESSORIES
23 3700 AIR OUTLETS AND INLETS

**DIVISION 26 - ELECTRICAL**

26 0100 BASIC ELECTRICAL REQUIREMENTS
26 0505 SELECTIVE DEMOLITION FOR ELECTRICAL
26 0519 LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES
26 0526 GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS
26 0529 HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS
26 0533.13 CONDUIT FOR ELECTRICAL SYSTEMS
26 0533.16 BOXES FOR ELECTRICAL SYSTEMS
26 0553 IDENTIFICATION FOR ELECTRICAL SYSTEMS
26 0583 WIRING CONNECTIONS
26 0923 LIGHTING CONTROL DEVICES
26 2416 PANELBOARDS
26 2726 WIRING DEVICES
26 5100 INTERIOR LIGHTING

**DIVISION 27 - COMMUNICATIONS**

27 0741 TELEPHONE / DATA / POS SERVICE, PATHWAYS AND WIRING

**DIVISION 28 - ELECTRONIC SAFETY AND SECURITY**

28 2743 E_A_S_ SYSTEM AND CCTV SYSTEM
28 3749 BUILDING SECURITY
28 4721 ADDRESSABLE FIRE ALARM SYSTEM
28 5747 AUDIO / VISUAL SYSTEM

**DIVISION 31 - EARTHWORK**

Not Used

**DIVISION 32 - EXTERIOR IMPROVEMENTS**

Not Used

**APPENDICES**

APPENDIX A.1 –VENDOR MATRIX
APPENDIX B-1 – PROJECT CLOSEOUT PHOTOS REQUIRED
APPENDIX B-2 – BRANDED WALL AT MALL – PROJECT CLOSEOUT PHOTOS REQUIRED
APPENDIX B-3 – BRANDED AREA – PROJECT CLOSEOUT PHOTOS REQUIRED
APPENDIX D – GC DOCUMENT CLOSEOUT CHECKLIST
APPENDIX E – PROGRESS REPORT
APPENDIX F – UTILITY REQUEST FORMS
APPENDIX G – CERTIFICATE OF COMPLETION - CONTRACTOR

**SECTION 00 2113**

**INSTRUCTIONS TO BIDDERS**

**SUMMARY**

**1.01 DOCUMENT INCLUDES**

A. Invitation
   1. Bid Submission
   2. Intent
   3. Work Identified in the Contract Documents
   4. Contract Time

B. Bid Documents and Contract Documents
   1. Definitions
   2. Availability
   3. Examination
   4. Inquiries/Addenda
   5. Product/Assembly/System Substitutions

C. Site Assessment
   1. Site Examination
   2. Prebid Conference

D. Qualifications
   1. Qualifications
   2. Subcontractors/Suppliers/Others

E. Bid Submission
   1. Submission Procedure
   2. Bid Ineligibility

F. Bid Enclosures/Requirements
   1. Performance Assurance
   2. Insurance
   3. Bid Form Requirements
   4. Fees for Changes in the Work
   5. Bid Form Signature
   6. Additional Bid Information

G. Offer Acceptance/Rejection
   1. Duration of Offer
   2. Acceptance of Offer

**INVITATION**

**2.01 BID SUBMISSION**

A. Bids signed and under seal, executed, and dated will be received at the office of DSG before 2:00 p.m. local standard time on the 4 day of January.

B. Offers will be opened privately immediately after the time for receipt of bids.

**2.02 INTENT**

A. The intent of this Bid request is to obtain an offer to perform work to complete a Dick's Sporting Goods Footwear remodel located at 1321 N. Columbia Center Boulevard, Kennewick, WA for a Stipulated Sum contract, in accordance with the Contract Documents.

**2.03 WORK IDENTIFIED IN THE CONTRACT DOCUMENTS**

A. Work of this proposed Contract comprises building construction, site development, remodeling, renovation, and demolition, including general construction Work.

**2.04 CONTRACT TIME**

A. General Contractor agrees without reservations, to expedite and commence his work immediately upon receipt of notice to proceed, with sufficient and qualified manpower to maintain established schedules. If, in Owner's judgment, it becomes necessary to accelerate work at any particular point and accelerate work at a specified location, General Contractor shall cease work at any particular point and accelerate work at the specified location.

B. General Contractor understands and agrees that starting and completion dates as indicated in these Contract Documents comprising the entire agreement between said parties, are subject to change by the Owner. No additional compensation will be paid to the General Contractor as a result of change in starting or completion dates.

C. Preliminary schedule to be submitted with Bid based on Owner provided start and completion dates.

**BID DOCUMENTS AND CONTRACT DOCUMENTS**

**3.01 DEFINITIONS**

A. Bid Documents: Contract Documents supplemented with Invitation To Bid, Instructions to Bidders, Information Available to Bidders, Bid Form Supplements To Bid Forms and Appendices identified.

B. Contract Documents: Defined in AIA A201 Article 1 including issued Addenda.

C. Addenda: Written or graphic instruments issued by the Architect prior to the execution of the Contract which modify or interpret the Bidding Documents by additions, deletions, clarification or corrections.

D. Bid, Offer, or Bidding: Act of submitting an offer under seal.

E. Bid Amount: Monetary sum identified by the Bidder in the Bid Form.

**3.02 AVAILABILITY**

A. Bid Documents for each bidder is to be obtained electronically from the Architect from an electronic file server. Bidders will be responsible for downloading the Bid Documents and reproducing the documents to prepare their Bid.

B. Bid Documents are made available only for the purpose of obtaining offers for this project. Their use does not grant a license for other purposes.

C. Bid Documents will not be issued directly to Sub-bidders.

**3.03 EXAMINATION**

A. Upon receipt of Bid Documents verify that documents are complete. Notify Architect should the documents be incomplete.

B. Immediately notify Architect upon finding discrepancies or omissions in the Bid Documents.

C. Bidders shall use complete sets of Bidding Documents in preparing Bids; neither the Owner nor Architect assumes responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

D. The Instruction to Bidders, General Conditions, Supplementary General Conditions and General Requirements shall be applicable to every division and Section of these Specifications, and are binding upon all Subcontractors and Suppliers.

**3.04 INQUIRIES/ADDENDA**

A. Direct questions to Architect, email; bskillman@onyxcreative.com.

B. Addenda may be issued during the bidding period. All Addenda become part of the Contract Documents. Include resultant costs in the Bid Amount. The bidder shall be responsible for transmitting Addenda information to all concerned with their bid. Receipt of Addenda shall be acknowledged on the Bid Form.

C. Verbal answers are not binding on any party.

D. Clarifications requested by bidders must be in writing not less than 7 days before date set for receipt of bids. The reply will be in the form of an Addendum, a copy of which will be forwarded to known recipients.

**3.05 PRODUCT/ASSEMBLY/SYSTEM SUBSTITUTIONS**

A. Where the Bid Documents stipulate a particular product, substitutions will be considered up to 7 days before receipt of bids.

B. When a request to substitute a product is made, Architect may approve the substitution and will issue an Addendum to known bidders.

C. The submission shall provide sufficient information to determine acceptability of such products.

D. Provide complete information on required revisions to other work to accommodate each proposed substitution.

E. Provide products as specified unless substitutions are submitted in this manner and accepted.

F. See Section 01 6000 - Product Requirements for additional requirements.

**SITE ASSESSMENT**

**4.01 SITE EXAMINATION**

A. Examine the project site before submitting a bid.

B. The bidder is required to contact Owner in order to arrange a date and time to visit the project site.

C. After bid have been submitted, bidders shall be presumed to have full knowledge of conditions relating to or affecting performance of work under this Contract. Submission of a bid shall be taken as prima facie evidence for compliance with this requirement. No extra costs will be considered for failure to comply with this section before signing Contract.

**4.02 PREBID CONFERENCE**

A. A bidders conference will be held on site at a date and time established by the Owner.

**QUALIFICATIONS**

**5.01 EVIDENCE OF QUALIFICATIONS**

A. To demonstrate qualification for performing the Work of this Contract, bidders may be requested to submit AIA A305.

B. Provide copies of proof of registration to do business in the local jurisdiction of the project, local business license number, and State sales and use tax registration number.

**5.02 SUBCONTRACTORS/SUPPLIERS/OTHERS**

A. Each bidder shall name the Subcontractors upon which he has based his bid. Provide these names where indicated on the Bid Form.

B. Owner reserves the right to reject a proposed subcontractor for reasonable cause.

C. Refer to General Conditions.

**BID SUBMISSION**

**6.01 SUBMISSION PROCEDURE**

A. Bidders shall be solely responsible for the delivery of their bids in the manner and time prescribed.

B. Submit two copies of the executed offer on the Bid Forms provided, signed and sealed in a closed opaque envelope, clearly identified with bidder's name, project name and Owner's name on the outside.

C. Improperly completed information, irregularities in bid bond, may be cause not to open the Bid Form envelope and declare the bid invalid or informal.

D. Proposals shall be based on materials and methods described in the Construction Documents. All local, state and federal taxes shall be included in the Bid. Quote all unit prices and give all

breakdowns included in Bid Form. The total price indicated shall be the total cost to the Owner, including all Overhead and Profit.

E. The Proposal shall not contain a recapitulation of the work to be done, but shall be filled in appropriately in the blank areas provided.

**6.02 BID INELIGIBILITY**

A. Bids that are unsigned, improperly signed or sealed, conditional, illegible, obscure, contain arithmetical errors, erasures, alterations, or irregularities of any kind, may at the discretion of the Owner, be declared unacceptable.

B. Bid Forms, Appendices, and enclosures that are improperly prepared may, at the discretion of Owner, be declared unacceptable.

C. Bids are by invitation, only from selected bidders. Bids from unsolicited bidders may be returned.

D. No oral or telephonic proposals for modification will be considered. Bids faxed in on time with a follow up hard copy are acceptable.

**BID ENCLOSURES/REQUIREMENTS**

**7.01 PERFORMANCE ASSURANCE**

A. Accepted Bidder: Provide a Performance and Payment bond as described in 00 7300 - Supplementary Conditions.

B. Include the cost of performance assurance bonds in the Bid Amount.

C. The bond shall be issued by a Surety Company authorized to do business in the state in that the work is located, and shall remain in affect one year after Contract Closeout. The Bond and Surety must be approved by the Owner.

**7.02 INSURANCE**

A. Provide an executed "Undertaking of Insurance" on a standard form provided by the insurance company stating their intention to provide insurance to the bidder in accordance with the insurance requirements of the Contract Documents.

**7.03 BID FORM REQUIREMENTS**

A. Complete all requested information in the Bid Form and Appendices. Proposal shall be made in the form provided with all blank application spaces in the form to be fully filled. It shall contain the total bid stated both in writing and in figures. The signatures shall be longhand, and the completed form shall be without interlineations, alterations or erasure.

B. Taxes: Refer to Document 00 7300 - Supplementary Conditions for inclusion of taxes, procedures for tax rebate claims, and products that are tax exempt.

C. It is the General Contractor's responsibility to obtain and pay for the building permit. This cost shall be included in the base bid.

D. State any qualifications or explanations of the Bid on the bidder's stationary with letterhead, and submit in duplicate with Bid.

E. General Contractor shall furnish all labor, materials, tools, scaffolding, ladders, equipment, fuel, permits, fees, reports, certificates, insurance, taxes, etc. in accordance with drawings, specifications, and addenda, if any, to complete his scope of work.

**7.04 FEES FOR CHANGES IN THE WORK**

A. Include the fees for overhead and profit on own Work and Work by subcontractors, identified in Document 00 7300 - Supplementary Conditions .

B. Include in the Bid Form, the overhead and profit fees on own Work and Work by subcontractors, applicable for Changes in the Work, whether additions to or deductions from the Work on which the Bid Amount is based.

C. Include in the Bid Form, the fees proposed for subcontract work for changes (both additions and deductions) in the Work. Contractor shall apply fees as noted, to the subcontractor's gross (net plus fee) costs on additional work.

**7.05 BID FORM SIGNATURE**

A. The Bid Form shall be signed by the bidder, as follows:
   1. Sole Proprietorship: Signature of sole proprietor in the presence of a witness who will also sign. Insert the words "Sole Proprietor" under the signature. Affix seal.
   2. Partnership: Signature of all partners in the presence of a witness who will also sign. Insert the word "Partner" under each signature. Affix seal to each signature.
   3. Corporation: Signature of a duly authorized signing officer(s) in their normal signatures. Insert the officer's capacity in which the signing officer acts, under each signature. Affix the corporate seal. If the bid is signed by officials other than the president and secretary of the company, or the president/secretary/treasurer of the company, a copy of the by-law resolution of their board of directors authorizing them to do so, must also be submitted with the Bid Form in the bid envelope.
   4. Joint Venture: Each party of the joint venture shall execute the Bid Form under their respective seals in a manner appropriate to such party as described above, similar to the requirements of a Partnership.

**7.06 ADDITIONAL BID INFORMATION**

A. Submit the following Supplements concurrent with bid submission:
   1. Document 00 4322 - Unit Prices Form: Include a listing of unit prices specifically requested by the Contract Documents.
   2. Document 00 4325 - Substitution Request Form - During Procurement.
   3. Document 00 4327 - Separate Prices Break-Out Form: Include a listing of separate prices as specifically requested in the Contract Documents.
   4. Document 00 4373 identifies the Bid Amount segmented into portions as requested.

B. Utility Company Rules
   1. Rules of local Utility companies shall be complied with. Before Bid is submitted, the General Contractor shall check with each utility company supplying services to this work, and shall determine all requirements and include in his bid the cost of the same.

C. DSG Specialty Items
   1. General Contractor shall install items furnished by DSG, as indicated on the drawings and/or specified.
   2. General Contractor’s bid to include receiving, unloading, inventory, storage, protection, installation, labor, equipment and erections materials required to completely install all of the items provided by DSG and installed by the General Contractor.
   3. General Contractor shall provide material and labor warranty for all products, systems, and equipment. Regarding National Account Vendor (NAV) items, the General Contractor is responsible for labor warranties while the NAV shall cover the material warranty.

**OFFER ACCEPTANCE/REJECTION**

**8.01 DURATION OF OFFER**

A. Bids shall remain open to acceptance and shall be irrevocable for a period of ninety (90) days after the bid closing date.

**8.02 ACCEPTANCE OF OFFER**

A. Owner reserves the right to accept or reject any or all offers. The Owner may, upon prior notice to General Contractor, assign this work in whole or in part; provided that the Owner shall be liable to the General Contractor for payment to be hereunder up to the time of such assignments.

B. The Owner does not obligate itself for any costs incurred by the Bidder in preparing bids. The Owner does not obligate itself to accept the lowest or any bid.

C. Bidder to whom work is awarded shall execute an agreement directly with the Owner.

**END OF SECTION**

**SECTION 00 4100**

**BID FORM**

**THE PROJECT AND THE PARTIES**

**1.01 TO:**

A. Owner
Attn: Construction Coordinator
345 Court Street
Coraopolis, PA 15108

**1.02 FOR:**

A. Project: DSG Preliminary Specification

**1.03 DATE: _____ (BIDDER TO ENTER DATE)**

**1.04 SUBMITTED BY: (BIDDER TO ENTER NAME AND ADDRESS)**

A. Bidder's Full Name _____
1. Address _____
2. City, State, Zip_____

**1.05 OFFER**

A. Having examined the Place of The Work and all matters referred to in the Instructions to Bidders and the Contract Documents prepared by _____ for the above mentioned project, we, the undersigned, hereby offer to enter into a Contract to perform the Work for the Sum of:

B. _____
_____ dollars
($_____), in lawful money of the United States of America.

C. We have included the required performance assurance bonds in the Bid Amount as required by the Instructions to Bidders.
1. The cost of the required performance assurance bonds is _____dollars ($_____), in lawful money of the United States of America.

D. All applicable federal taxes are included and State of _____ taxes are included in the Bid Sum.

E. All Cash and Contingency Allowances described in Section 01 2100 - Allowances are included in the Bid Sum.

**1.06 ACCEPTANCE**

A. This offer shall be open to acceptance and is irrevocable for ninety days from the bid closing date.

B. If this bid is accepted by Owner within the time period stated above, we will:
1. Execute the Agreement within _____ days of receipt of acceptance of this bid.

**1.07 CONTRACT TIME**

A. If this Bid is accepted, we will:

B. Complete the Work by the _____ day of _____, _____. (Bidder to enter day, month, and year.)

**1.08 CHANGES TO THE WORK**

A. When Architect establishes that the method of valuation for Changes in the Work will be net cost plus a percentage fee in accordance with General Conditions, our percentage fee will be:
1. _____ percent overhead and profit on the net cost of our own Work;
2. _____ percent on the cost of work done by any Subcontractor.

B. On work deleted from the Contract, our credit to Owner shall be Architect-approved net cost plus _____ of the overhead and profit percentage noted above.

**1.09 ADDENDA**

A. The following Addenda have been received. The modifications to the Bid Documents noted below have been considered and all costs are included in the Bid Sum.
   1. Addendum # _____ Dated _____.
   2. Addendum # _____ Dated _____.

**1.10 BID FORM SUPPLEMENTS**

A. The following Supplements are attached to this Bid Form and are considered an integral part of this Bid Form:
   1. Document 00 4322 - Unit Prices Form: Include a listing of unit prices specifically requested by the Contract Documents.
   2. Document 00 4327 - Separate Prices Break-Out Form: Include a listing of separate prices as specifically requested in the Contract Documents.

**1.11 BID FORM SIGNATURE(S)**

A. The Corporate Seal of

B. _____

C. (Bidder - print the full name of your firm)

D. was hereunto affixed in the presence of:

E. _____

F. (Authorized signing officer, Title)

G. (Seal)

H. _____

I. (Authorized signing officer, Title)

**END OF SECTION**

**SECTION 00 4322**

**UNIT PRICES FORM**

**RBTS FORM OF PROPOSAL**

NOTE: The wording of this proposal shall be retained throughout, without change, alterations, or additions. Any change in the wording may cause the Proposal to be rejected.

**PROPOSAL**

TO: DICK'S SPORTING GOODS

Attn: Construction Coordinator

345 Court Street

Coraopolis, PA 15108

Tel. 724-273-3136

Fax 724-227-1429

SUBMITTED BY: General Contractor

_____

_____

_____

DATE: _____

Having read the specifications and examined the drawings for the Project entitled:

DICK'S SPORTING GOODS

Mall Name: _____

City, State: _____

PREPARED BY:

These documents were prepared for construction of said project, and having also received, read and taken into account all addenda and likewise having inspected the site of and the conditions affecting and governing the construction of said project, the undersigned hereby proposes to furnish all material and to perform all labor as specified and described in said work, for the contract price as set forth below.

This Proposal includes drawings, specifications and addenda numbered and dated:

DRAWINGS:

SPECS:

ADDENDA:

**BASE BIDS**

The proposed contract price includes all labor, materials, equipment and services to construct a Dick's Sporting Goods store as per plans and specifications:

_____DOLLARS ($_____)

**********

DIVISIONS 0 AND 1 COST_____DOLLARS ($_____)

Names of “Major” subcontractors and prices include in base bid:

FIRE PROTECTION_____DOLLARS ($_____)

PLUMBING_____DOLLARS ($_____)

H.V.A.C_____DOLLARS ($_____)

ELECTRICAL_____DOLLARS ($_____)

Provide the following prices per SQ. FT., including labor and materials, unless noted otherwise:

A. GENERAL WORK:

1. Drywall partitions w/taping and sanding adding (14'0" HIGH) ($_____S.F.)
2. Acoustical Ceiling (2' X 4') for adding ($_____S.F.)
3. Resilient flooring, for adding ($_____S.F.)
4. Carpet, per SQ. YD. Furnished and installed ($_____S.F.)
5. Metal door and frame, furnished and installed ($_____S.F..)
6. Average price per emergency exit hardware ($_____S.F.)
7. Rock excavation (per Cubic Yard) ($_____C.Y.)
8. Fire extinguisher with mounting bracket (installed) ($_____EA.)
9. Emergency exit sign – wall and pendant (installed) ($_____EA.)

10. Door signs (See Section 10440) ($_____EA.)

B. ELECTRICAL WORK:

1. Price of each electrical light fixture indicated on drawings, including installation.
   a. Fixture Type A ($_____EA.)

   b. 2'X4' Lay-in Fixture ($_____EA.)

   c. 8 FT. (1) Tube Fluorescent ($_____EA.)

   d. Emergency Wall Pack ($_____EA.)

   e. Exit Lights/Signs (Wall mount/pendant hung) ($_____EA.)

C. FIRE PROTECTION

1. Price for adding sprinkler heads in sales area ($_____EA.)

2. Price for adding sprinkler heads in office area ($_____EA.)

3. Price for adding sprinkler heads in stock area ($_____EA.)

D. PERCENTAGE OF OVERHEAD AND/OR PROFIT: (MARK-UP BY G.C)

1. For General Contractor's extra work orders _____%

2. For Subcontractor's extra work orders _____%

Are costs of local building permits included in bid YES ____ NO ____ .

Cost of performance and payment bond if required by the Owner (See Section 00550 for definition)

(not included in base bid) ($_____)

NOTE: The above information and blanks must be fully completed by each General Contractor and submitted with Bid Proposal.

The undersigned agrees to commence the Work after authorization by the Owner (See Section 00550 for definition) but no later than_____(date) and complete all Work within_____ Calendar days. (Note conditions for Liquidated Damages).
Upon acceptance by the Owner (See Section 00500 for definition) of this proposal , the undersigned agrees to promptly execute a Contract Agreement with the Owner (See Section 00550 for definition) for the accomplishment of the Work called for in the Contract Documents applicable to this Proposal.

Firm Name_____DATE_____

By:_____

Title:_____

Address:_____

_____

_____

Telephone:_____

Fax:_____

E-mail:_____

Contractor's License Number:_____

NOTE: If the Bidder is a corporation, indicate state of incorporation after Signature and affix Corporate Seal. If a partnership, give full names and residential addresses and telephone of all partners.

**END OF SECTION**

**SECTION 00 4327**
**SEPARATE PRICES BREAK-OUT FORM**

**See form immediately following this page.**

**END OF SECTION**

# COST BREAKDOWN

**Project # & Name:**
**General Contractor:**
**Leased Square Feet:**
**Type of Construction:**
**Project Manager:**

## CONSTRUCTION BUDGET

| | CSI | General Contractor/ Landlord |
|---|---|---|
| **GENERAL CONDITIONS** | | |
| Contract General Conditions | 00700 | |
| Sales Tax | 01110 | |
| Insurance | 01111 | |
| Construction Management | 01310 | |
| Testing / Inspection | 01411 | |
| Contractor's Fee | 01500 | |
| Permit/Fees | 01505 | |
| Tap Fees | 01510 | |
| Final Cleaning | 01740 | |
| Total General Conditions | | $ - |
| **SITE WORK** | | |
| General Demolition | 02050 | |
| Earthwork | 02300 | |
| Site Lighting | 02580 | |
| Paving | 02700 | |
| Sidewalks & Handicapped Ramps | 02775 | |
| Utilities | 02500 | |
| Curbs & Gutters | 02770 | |
| Regular Bollards | 02840 | |
| Site Landscaping/Irrigation | 02900 | |
| Total Site Work | | $ - |
| **CONCRETE** | | |
| Cast-in-Place Concrete | 03300 | |
| Precast / Tilt Panels | 03400 | |
| Total Concrete | | $ - |
| **MASONRY** | | |
| Unit Masonry | 04200 | |
| Brick Veneer | 04810 | |
| Total Masonry | | $ - |
| **METAL** | | |
| Structural Steel | 05120 | |
| Metal Fabrications i.e-Signage Structure | 05500 | |
| Decorative Metal Fabrications (Both sides of Mall Entrance) | 05700 | |
| Cart Coral | 05730 | |

# COST BREAKDOWN

**Project # & Name:**
**General Contractor:**
**Leased Square Feet:**
**Type of Construction:**
**Project Manager:**

## CONSTRUCTION BUDGET

| | | General Contractor/ |
|---|---|---|
| **Total Metal** | | $ - |
| **WOOD AND PLASTICS** | | |
| **General Carpentry** | **06100** | |
| **Millwork** | **06220** | |
| **Perimeter Trim** | **06450** | |
| **Faux Beams** | **06600** | |
| **Total Woods & Plastics** | | $ - |
| **THERMAL & MOISTURE PROTECTION** | | |
| **Wall and Rigid Insulation** | **07218** | |
| **Exterior Ins & Finish System** | **07240** | |
| **Roofing / Flashing / Roof Accessories** | **07500** | |
| **Total Thermal & Moisture Protection** | | $ - |

# COST BREAKDOWN

**Project # & Name:**
**General Contractor:**
**Leased Square Feet:**
**Type of Construction:**
**Project Manager:**

## CONSTRUCTION BUDGET

| | | General Contractor/ |
|---|---|---|
| **DOORS AND WINDOWS** | | |
| Doors/ Frames & Finish Hardware | 08110 | |
| Security Grilles/Shutter | 08330 | |
| Hurricane Shutter | 08390 | |
| Dock Doors | 08365 | |
| Alum. Storefront System | 08410 | |
| Automatic Entry Doors | 08460 | |
| Glazing | 08800 | |
| Total Doors & Windows | | $ - |
| **FINISHES** | | |
| Gypsum Board Systems | 09250 | |
| Ceramic Tile | 09300 | |
| Suspended Acoustical Ceilings | 09510 | |
| Flooring (Other than Ceramic) | 09600 | |
| Faux Stone Walls | 09750 | |
| Painting | 09900 | |
| Total Finishes | | $ - |
| **SPECIALTIES** | | |
| Miscellaneous Specialties | 10100 | |
| Toilet Partitions & Accessories | 10165 | |
| Wall and Corner Guards | 10260 | |
| Exterior Signage | 10430 | |
| Restroom Identifiers & Other Interior signs related to Operation of the Building | 10440 | |
| Stock Room Shelving | 10670 | |
| Fire Extinguishers | 10520 | |
| Acrovyn Wall Panel | | |
| Total Specialties | | $ - |
| **EQUIPMENT** | | |
| Audio and Visual Equipment | 11130 | |
| Loading Dock Equipment | 11160 | |
| Compactor | 11172 | |
| Total Equipment | | $ - |
| **FURNISHINGS** | | |
| Murals / Artwork | 12110 | |
| Total Furnishings | | $ - |
| **SPECIAL CONSTRUCTION** | | |

# COST BREAKDOWN

**Project # & Name:**
**General Contractor:**
**Leased Square Feet:**
**Type of Construction:**
**Project Manager:**

## CONSTRUCTION BUDGET

| | | General Contractor/ |
|---|---|---|
| **Fire Protection System** | **13900** | |
| **Total Special Construction** | | $ - |
| **CONVEYING SYSTEMS** | | |
| **Elevators** | **14200** | |
| **Escalators-Passenger** | **14300** | |
| **Conveyor - Merchandise** | **14500** | |
| **Total Conveying Systems** | | $ - |

# COST BREAKDOWN

**Project # & Name:**
**General Contractor:**
**Leased Square Feet:**
**Type of Construction:**
**Project Manager:**

## CONSTRUCTION BUDGET

| | | General Contractor/ |
|---|---|---|
| **MECHANICAL** | | |
| Plumbing | 15000 | |
| HVAC | 15500 | |
| Ductwork | 15800 | |
| Total Mechanical | | $ - |
| **ELECTRICAL** | | |
| Electrical Connection to Store Fixtures | 16150 | |
| Service and Distribution | 16400 | |
| Interior Lighting Fixtures i.e.-HID, Florescents, Exit | 16510 | |
| Exterior Lighting - i.e-Wall Wash, Lights behind Letters | 16520 | |
| Parking Lot Lighting/Electrical (if we own) | 16521 | |
| Interior Decorative Lighting Fixtures i.e.-track | 16550 | |
| Telephone System (low Voltage) | 16720 | |
| Fire Alarm | 16721 | |
| Data and Communication Equipment (Source One) | 16740 | |
| Merchandise Security System (Sensormatic) | 16743 | |
| Store Security System (ADT) | 16749 | |
| Pole Mounted/Free Standing Outdoor Lighting | N/A | |
| Total Electrical | | $ - |
| **ENERGY MANAGEMENT SYSTEMS** | | |
| EMS | 17010 | |
| Total EMS | | $ - |
| **ABATEMENT** | | |
| Asbestos Abatement | 18201 | |
| Total Asbestos Abatement | | $ - |
| **Total Construction Bid** | | $ - |
| Cost Per Square Foot | | #DIV/0! |

## Please list add Alternates below.

**SECTION 00 7100**

**CONTRACTING DEFINITIONS**

## PART 1 GENERAL

### 1.01 APPLICABILITY: THESE DEFINITIONS ARE INTEGRAL TO THE AGREEMENT.

### 1.02 DEFINITIONS

A. Definition of Owner: Any references in this specification to the Owner for this project is referring to:
   1. Build to Suit - The Landlord (Insert Name of Developer) is the Owner on Build to Suit (BTS) projects.
      a. All work, materials, and systems shown on the plans and specifications including all referenced national accounts is the sole responsibility of the Landlord (and/or the Landlord's General Contractor) to purchase, schedule, and install the complete and entire system as shown and referenced.
      b. Dick's Sporting Goods (DSG) is the Tenant and has no scope of responsibility for work shown on these plans and/or specifications.
   2. Dick's Sporting Goods (DSG) is the Owner on Reverse Build to Suit (RBTS) projects.
      a. All work, materials, and systems shown on the plans and specifications including all referenced national accounts is the sole responsibility of DSG's General Contractor to purchase, schedule, and install the complete and entire system as shown and referenced.
      b. The Landlord's scope of responsibility will be for work outside the scope of these plans and/or specifications.

B. Contract Documents: As defined in the Agreement.
   1. At the time of execution of the Agreement, the Contract Documents consist of the following:
      a. The Agreement and Conditions of the Contract, and other documents listed on the Table of Contents under the heading Contracting Requirements.
   2. From time to time after execution of the Agreement, upon approval by the Owner, the following types of documents will be incorporated into the Contract Documents:
      a. Drawings and other documents documenting the design.
      b. Construction drawings and specifications detailing the execution of the design.

### 1.03 DEFINITIONS - TIME PERIODS AND MILESTONE DATES

A. Preliminary Design: The time period during which the design criteria are finalized and preliminary drawings and written descriptions are prepared to illustrate the proposed design of the work or a portion of the work to the Owner, as described in the Conditions of the Contract.

B. Design Development: The time period during which the form, arrangement, size, and materials of the work or a portion of the work are determined _____.
   1. The end of the Design Development period occurs before the beginning of preparation of construction documents.

C. Construction Documents: The time period during which process working drawings, specifications, and other documents describing the work or a portion of the work are prepared in sufficient detail to allow accurate and complete construction.

D. Construction: The time period from the beginning of work on the project site until final payment _____.

E. Substantial Completion: The date as defined in the Conditions of the Contract. Date of Substantial Completion is the due date for the following:
   1. Owner's complete punchlist of items to be completed.
   2. Compliance with requirements of governing authorities, for submittals, inspections, and permits.
   3. Compliance with Owner's requirements for access to areas occupied by the Owner.

F. Closeout: The time period during which all details of both construction and commissioning are completed.
   1. The Closeout period is the time from Date of Substantial Completion until final payment, both as defined by the Conditions of the Contract.
   2. Before and during the Closeout period, the Owner will ascertain whether the completed project complies with the the Contract Documents.

G. Occupancy: The time period during which the project is occupied for its intended purpose.
   1. The Occupancy period begins at Date of Substantial Completion, as defined by the Conditions of the Contract.

H. Correction Period: The time period defined by the Conditions of the Contract.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SECTION**

## SECTION 00 7200
## GENERAL CONDITIONS

**FORM OF GENERAL CONDITIONS**

**1.01 A.I.A. DOCUMENT A-201, CURRENT EDITION**

A. The above mentioned document, "General Conditions of the Contract for Construction", shall become a part of these specifications as though fully written herein.

B. A copy of this document may be reviewed at the Architect's office by anyone bidding this project.

**END OF SECTION**

**SECTION 00 7300**

**SUPPLEMENTARY CONDITIONS**

## PART 1 GENERAL

### 1.01 SUMMARY

A. These Supplementary Conditions amend and supplement the General Conditions defined in Document 00 7200 - General Conditions and other provisions of the Contract Documents as indicated below. Provisions that are not so amended or supplemented remain in full force and effect.

B. The terms used in these Supplementary Conditions that are defined in the General Conditions have the meanings assigned to them in the General Conditions.

### 1.02 MODIFICATIONS TO GENERAL CONDITIONS

A. ARTICLE 2.1.3 ADD AS FOLLOWS:

1. The Owner is:
   AS DEFINED HEREIN SHALL MEAN OCCUPANT OF SPACE
   AS LESSEE/TENANT OR OWNER
   DICK'S SPORTING GOODS
   345 Court Street
   Coraopolis, PA 15108

B. ARTICLE 4.1.1a ADD AS FOLLOWS:

1. The Architect is:
   Architect of Record_____
   Address_____
   Telephone_____
   Fax_____
   E-mail_____

C. ARTICLE 11.1.1 ADD THE FOLLOWING:

1. The Contractor shall not commence Work until it has furnished two (2) copies of the requisite Certificates of Insurance evidencing that it has obtained the following Insurance which shall be secured with companies licensed to do business in the state in which the work is to be performed and in satisfactory form to the Owner.
2. The Certificates of Insurance must provide that said insurance is "primary" and that the insurer will give the Owner at least thirty (30) days prior written notice of material change in, cancellation, or non-renewal of such insurance. Said certificates and written notices shall be directed to:
   Aon Risk Services
   One Federal St
   Boston MA 02110
   Attn: Gordon Otis
3. The Certificates of Insurance shall name Dick's Sporting Goods, Inc. and the property owner or its representative if required, as an additional insured; however, under no circumstance shall Dick's or the property owner be liable for payment of any premiums. Additionally, it is understood that the coverage granted to Dick's as an additional insured shall apply on a primary basis with Dick's own coverage being excess.
4. The types and limits of insurance that the Contractor is required to carry at its expense are:

| | | |
|---|---|---|
| a. | Workers' Compensation | Statutory |
| b. | Employers' Liability | $100,000 Each Accident |
| | | $500,000 Disease - Policy Limit |
| | | $500,000 Disease - Each Employee |
| c. | General Liability | $1,000,000 Each Occurrence |
| | | $2,000,000 General Aggregate |

Including, but not limited to, Premises Operations, Independent Contractors, Products & Completed Operations, Personal Injury, Contractual Liability, Explosion, Bodily Injury and Property Damage, Combined Single Limit: General Liability Policy shall be on occurrence basis and shall include coverage for Explosion, Collapse and Underground when the work to be performed involves blasting, explosion, moving, shoring, underpinning, razing or demolition of any structure, grading of land, paving, excavating, drilling, borrowing, filling, pile driving or caisson work.

d. Automobile Liability Including Owned, Non-Owned & Hired Vehicles, Bodily Injury and Property Damage Combined Single Limit
   $1,000,000 Each Occurrence
e. Owner's Protective Liability
   Bodily Injury and Property Damage
   Combined Single Limit $1,000,000 Each Occurrence
   $2,000,000 General Aggregate
f. Umbrella Liability
   Bodily Injury and Property Damage
   Combined Single Limit $5,000,000 Each Occurrence
   $5,000,000 Aggregate
g. The Contractor shall maintain the above insurance at all times until final completion of the Work, except insurance for Completed Operations which it shall maintain for two years after final completion of the Work.
h. Maintenance of insurance by the Contractor as specified in this Article shall in no way be interpreted as relieving the Contractor of any responsibly and shall not in any manner limit or qualify the liabilities and obligations of the Contractor whatsoever, and the Contractor may carry, also at its own expense, such additional insurance as it deems necessary.
i. The Contractor shall require of Subcontractors, unless otherwise approved by the Owner, to also carry insurance equal in kind and amount to that required by this Article, but not including Owners' Protective Liability:
j. Owner disclaims any liability, responsibility and/or obligation for loss or damage to Contractor's and/or Subcontractor's equipment, material and tools due to theft, vandalism, fire or loss.
k. Property Insurance:
   1) The Contractor shall provide and maintain, at its own expense, an All-Risk Property Insurance policy to insure all Work of the Contract against any loss or damage, with a deductible acceptable to Owner.
l. The value of the insurance shall at all times be equal to or greater than the full value of the work (on-site and off- site), shall be in the names of both the Owner and the Contractor, as well as the property owner or its representative if required, payable to the respective parties as their interests may appear and any proceeds thereof shall be retained by the Owner as security for the performance by the Contractor in making good any loss, damage or injury. Upon such satisfactory performance by the Contractor, the proceeds shall be paid by the Owner to the Contractor.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SECTION**

**SECTION 00 9500**
**SPECIAL CONDITIONS**

## 1.01 SCOPE

A. The General Contractor shall furnish all labor, materials, supplies, equipment (including all utilities during construction and until the Owner's (See Section 00550 for definition) and/or Dick's Sporting Goods (DSG) acceptance of demised premises) and superintendence for performing all operations necessary to complete all requirements of the specified work in accordance with the drawings and provisions of the contract documents.

B. All work shall be done in accordance with all contract documents, but shall at all times observe and comply with all Federal and State laws, local ordinances and lawful regulations of the particular locality which may affect the completion of the work and shall meet the approval of inspection authorities having jurisdiction.

C. NOTE: Even though the Landlord/Developer and/or General Contractor are supplied with a complete set of construction drawings, it will be the Landlord/Developer and/or General Contractor's responsibility to comply with all items listed in the above paragraph. It is assumed by the Owner (See Section 00550 for definition) that all General Contractors and their subcontractors are fully aware of local conditions and requirements, therefore no additional costs will be paid by Owner (see Section 00550 for definition) for this work.

D. All materials of every kind and description are to be new, unless otherwise noted on drawings, and of the best quality. No substitution of materials or manufacturers herein specified shall be made without samples of designated materials having been submitted to Owner (Section 00550 for definition) and/or DSG for written approval.

E. Reporting Requirements:
   1. The General Contractor must submit weekly status report (See Appendix E) from commencement of project through completion. The reports must be received via email no later than 2:00 PM Thursday of each week (see attached). In addition, the General Contractor must E-Mail to DSG's Construction Project Manager assigned the project a minimum of 12 photos, also due on Thursday 2:00 PM. The format of the photos must be in JPG (640 x 480 resolution). At the request of the Architect of Record (AOR), a duplicate copy shall be sent to him.

## 1.02 CONTRACT DOCUMENTS

A. The Agreement, signed and executed by the Owner (See Section 00550 for definition) and General Contractor.

B. Owner (See Section 00550 for definition) shall cause its General Contractor and all subcontractors to observe and comply with these specifications and construction drawings. The term "General Contractor" as used herein shall be deemed to mean (1) the landlord's General Contractor or (2) each subcontractor, if the Tenant has not directly engaged a General Contractor. The General Contractor shall be primarily responsible for the performance of the work in accordance with these specifications and construction drawings, and nothing herein contained shall be deemed to relieve the General Contractor from such responsibility.

C. All construction contracts entered into (1) by Owner's (See Section 00550 for definition) General Contractor, or with subcontractors, as the case may be, shall incorporate the latest edition of American Institute of Architects Standard Documents No. A-201 General Conditions of the Contract for Construction. These specifications and construction drawings, together with the general conditions and any modifications thereof, govern all the work in so far as applicable. The general conditions, specifications and construction drawings have bearing upon similar subject matter, all shall apply wherever possible; otherwise, the more stringent conditions shall be followed.

D. Special Conditions of the Contract. Any reference to "Special Conditions" shall mean this section.

E. Specifications, Addenda, and Bulletins: Specifications and Addenda are effective upon date of issue. Bulletins are not effective until a signed Change Order is issued by DSG's Construction Project Manager.

F. Drawings: As named in the Agreement, revisions thereto, additional drawings, supplementary drawings and sketches issued.

G. Definitions of terms:
   1. BTS: Build to Suit.
   2. RBTS: Reverses Build to Suit.
   3. Owner: RBTS projects - DSG.
   4. Owner: BTS projects - Landlord.
   5. Tenant: BTS projects - DSG.

H. Abbreviations
   1. Those which may appear in the specifications or other contract documents shall mean the following:

| | |
|---|---|
| AIA | American Institute of Architects |
| ACI | American Concrete Institute |
| ADA | Americans with Disabilities Act. |
| AIEE | American Institute of Electrical Engineers |
| AISC | American Institute of Steel Construction |
| ASHRAE | American Society of Heating, Refrigeration and Air Conditioning Engineers |
| ASME | American Society of Mechanical Engineers |
| ASTM | American Society of Testing and Materials |
| AWMA | Aluminum Window Manufacturers Assn. |
| AWSC | American Welding Society Code |
| FS | Federal Specifications |
| GC | General Contractor |
| NBS | National Bureau of Standards (Dept. of Commerce) |
| NBFU | National Board of Fire Underwriters |
| NEC | National Electric Code |
| NEMA | National Electrical Manufacturers Assn. |
| NESC | National Electrical Safety Code |
| UL | Underwriters Laboratories, Inc. |
| OSHA | Occupational Safety & Health Act |

   2. Abbreviations on drawings to conform to separate listing shown on the drawings. Additional Abbreviations, if included in the contract documents, shall refer to well-known terms or common usage, and in case of doubt, the Architect will interpret such abbreviations.

I. Wherever the terms "as approved", "as directed", or similar expressions appear on the Contract Documents, the meaning shall be construed as "approved by the Architect of Record (AOR)" or "as directed by the AOR".

J. Within specifications, the omission of such as "the General Contractor", "shall", "a", "an", "the", "all", and the like is intended for brevity; the fully inferable sentence structure shall be considered supplied to the effect that the specifications are directional in describing the work.

K. Within the contract documents, words such as "provide", "furnish", "furnish and install", "supply", "include", and similar terms shall mean that the contractor shall supply labor, materials, tools, equipment and other things appurtenant and necessary to fully complete the work which is mentioned, in every case, unless the work is specified as not being a part of this Contract.

L. The term "trade" whenever it occurs in the specifications shall mean mechanics and workmen engaged in the work according to their special skills, or firms that hire them for that portion of the work which requires such skills.

**1.03 LIMIT OF WORK**

A. General Contractor and subcontractors will be required to keep their work within the confined limits of the site, without encroaching upon existing parking areas, lawns and other improvements, except in the extent permitted in writing by the Owner (See Section 00550 for definition).

**1.04 AWARD OF WORK**

A. Owner (See Section 00550 for definition) reserves the right to award the work in any manner they deem to be in their best interest, adjusting the contract price if necessary and mutually agreed.

**1.05 PERMITS**

A. The General Contractor shall, at no additional cost to the Owner (See Section 00550 for definition), procure all permits, tap in fees, licenses, give all notices necessary, obtain and furnish to the Owner (See Section 00550 for definition) all certificates for work for which certificates are required, pay for all Federal, State and Local fees, permits, licenses, taxes, etc. for construction and final connection to all public utilities. The General Contractor shall also furnish the Owner (See Section 00550 for definition) with a certificate of occupancy before any final construction payments are made. (See instructions to bidders for any special requirements that could apply for permitting).

**1.06 PLANS & SPECIFICATIONS**

A. The specifications and drawings complement one another. What is called for by one shall be as binding as if called for by both. Neither governs the other; both are directive concerning the work.

B. Where a conflict or omission may seem to appear, consult the Architect of Record (AOR) for a decision. Such decisions will be expressed in writing in the form of Addenda for such occurrences prior to contract execution, and in the form of Bulletins and Change Orders after the contract is executed.

C. Do not scale the drawings, dimensions shall govern. Large scale details govern over small scale details.

D. It is intended throughout that all work be fully completed, and that all anchorage, fastenings, rough hardware items, scribing and fitting as necessary, painting and finishing, together with all shop and field equipment as needed for handling, manufacturing, assembling, hauling, hoisting, etc., be supplied whether or not directly specified or shown on the drawings. Wherever the nature of the work may need patching and repairing to complete it properly, that also shall be supplied.

E. The General Contractor shall notify the AOR in writing, regarding any necessary items which may have been omitted from the Specifications and/or Drawings, and any irregularities, discrepancies or duplications between Drawings and Specifications. In case of such errors and omissions, the General Contractor shall not proceed with the Work in uncertainty, but shall consult the AOR regarding intent and revisions if necessary.

**1.07 COPIES FURNISHED TO THE GENERAL CONTRACTOR**

A. The “Bid Package” for each bidder is to be obtained electronically from the AOR from an electronic file server. Bidders will be responsible for downloading the Bid Package and reproducing the documents as needed to prepare their Bid.

**1.08 SHOP DRAWINGS**

A. The General Contractor shall check and verify all field measurements and shall submit with such promptness as to cause no delay in this work or in that of others, all shop drawings required for the work of all trades. It will be the General Contractor’s responsibility to check all shop drawings.

B. All sprinkler drawings, hydraulic calculations and supporting documentation must be submitted to local authorities having jurisdiction and sent electronically to DSG's insurance underwriter for review and approval prior to fabrication of any piping or system components.
   1. DSG's Underwriter:
      AON Risk Services, Inc. Of Massachusetts
      Aon Risk Services
      One Federal St
      Boston MA 02110
      Attn: Gordon Otis
      T. 617.457.7698
      C. 617.851.0910
      gordon.otis@aon.com
   2. Certificates of Insurance are to be sent to the following:
      a. AIG Property Casualty, Boston Office
         Attention: William Paradis
         100 Summer Street, 28th Floor
         Boston, MA 02110
         T. 617.330.8502
         C. 617.758.9627
      b. Dick's Sporting Goods, Corporate Office
         Attention: Julie Ross
         345 Court Street
         Coraopolis, PA 15108

C. No material, product, equipment or systems shall be ordered or purchased before Owner (See Section 00550 for definition) or its agents have approved the shop drawings or cut sheets. See individual sections.

**1.09 OWNERSHIP OF DRAWINGS**

A. All drawings, specifications and copies thereof furnished by the AOR are the property of Dick's Sporting Goods (DSG). They are not to be used on other work.

**1.10 SAMPLES**

A. The General Contractor shall furnish for approval all samples as directed. The work shall be in accordance with approved samples. Label samples with name of project, Owner (See Section 00550 for definition), General Contractor, and AOR, date submitted, "job commission number", manufacturer's name, catalog number, trade names, and all necessary technical data for positive identification. Furnish sufficient samples in each case to permit retainage of sample by DSG, General Contractor, AOR, Subcontractor, and others such as the Engineer of Record when requested.

**1.11 STANDARDS OF QUALITY**

A. Details of the specifications establish the standards of quality required, either by description or by reference to brand names or the names of manufacturers.

B. Where only one product is mentioned by name, only that one shall be used. Where more than one product is named, any one of same may be regarded as the standard quality contingent upon compliance with the drawings and the specific quality specified.

C. To the extent deemed necessary by the AOR, producers of substitute materials will be required to furnish samples, literature, test and performance data, record of other installations, names of Owners (See Section 00550 for definition, AORs, General Contractors, and subcontractors, as references, statements of current financial condition, etc., in support of the supplier's claims of equality to that which is specified.

## 1.12 DELAYS

A. Inclement weather shall not be a valid cause for delay of the work, it being assumed that the General Contractor will estimate sufficiently for work stoppages because of inclement weather in his estimates for work progress and its completion.

B. Causes beyond the control of the General Contractor which delay the work, such as strikes, lockouts, fire or stoppages authorized, etc., shall extend the completion date by like periods of time as consumed in the delay, provided the General Contractor makes claim not more than seven (7) days after the cause of the delay begins.

## 1.13 RELATIONS OF GENERAL CONTRACTOR AND SUBCONTRACTOR

A. The General Contractor agrees to bind every subcontractor and every subcontractor agrees to be bound by the terms of the Contract Documents as far as applicable to his work, unless specifically noted to the contrary in a subcontract approval in writing by Owner (See Section 00550 for definition).

B. The Subcontractor agrees:
   1. To be bound to the General Contractor by terms of the Contract Documents and to assume all obligations and responsibilities that he by these documents, assumes toward Owner (See Section 00550 for definition) or DSG Construction Project Manager.
   2. To submit to the General Contractor applications for payment in such reasonable time as to enable the General Contractor to apply for payment on time from Owner (See Section 005500 for definition).
   3. Provide copies: Proof of registration to do business in the local jurisdiction of the project, local business license number, and State sales and use tax registration number.

C. The General Contractor agrees:
   1. To be bound to the subcontractor by all the obligations that Owner (See Section 00550 for definition) assumes to the General Contractor under the Contract Documents, and by all the provisions thereof affording remedies and redress to the General Contractor from DSG.
   2. To pay the subcontractor, upon payment of certificates the amount allowed to the General Contractor on account of the subcontractor's work, to the extent of the subcontractor's interest therein; or to pay the subcontractor on demand for his work or materials as far as executed and fixed in place, less the retained percentage at the time the certificate should be issued, even though the AOR fails to issue it for any cause not the fault of the subcontractor.
   3. To pay the subcontractor a just share of any fire insurance money received by him, the General Contractor, under a distribution arrangement in which the General Contractor acts as trustee for the subcontractors.
   4. To make no demand for penalty for delay in any sum to excess of such amount as may be specifically named in the subcontract.
   5. That no claim for services rendered or materials furnished by the General Contractor to the subcontractor shall be valid unless written notice thereof is given by the General Contractor to the subcontractor during the first ten (10) days of the calendar month following that in which the claim originated.
   6. To give the subcontractor an opportunity to be present and to submit evidence in any arbitration involving his rights.
      a. See Article 5.3 in the AIA Documents No. A-201, of the General Conditions.
   7. With each application for payment provide a signed and notarized lien waiver from past months applications for payment.

## 1.14 ARCHITECT OF RECORD'S STATUS AND DECISIONS

A. The AOR is the Agent of the Owner (See Section 00550 for definition) only to the extent provided in the Contract Documents and when in special instances authorized by the Owner (See Section 00550 for definition) to act show the General Contractor written authority.

## 1.15 TEMPORARY FACILITIES

A. Water - The General Contractor will provide temporary service as required and pay the cost of all water consumed. The General Contractor shall remove all temporary lines and fittings when the building is sufficiently completed to use permanent service.

B. Heat:
   1. The General Contractor shall provide all equipment, fuel and attendance necessary to provide temporary heat until such time as the building has temporary heat or permanent materials and the new heating installation is sufficiently completed that it can be properly operated as the means of temporary heating.
   2. Until the permanent facilities are operable, as determined by DSG, the General Contractor shall supply temporary heating by means of portable heating units or other approved appliances. Contractor shall be responsible for proper venting of such appliances and for removal of any smudges or other disfiguring marks resulting from their use.
   3. The permanent heating system can be used as the temporary source of heat after its completion. The General Contractor shall include the provision of temporary filters, provide all maintenance, attendance and operation required to operate the permanent heating system. The General Contractor will pay for temporary heating through use of permanent system.
   4. Upon completion of the project, the General Contractor shall replace filters, clean and restore the permanent heating systems to a new condition and acceptable in every respect.
   5. The following minimum temperatures shall be provided and maintained:
      a. In areas closed off, not being worked, but where freezing would not be a hazard, as judged by the DSG Construction Project Manager: NO HEAT
      b. In areas closed off, not being worked, but where freezing would be a hazard to the work, or in areas being worked by “wet” trades, such as plasters, concrete masonry, ceramic tile and the like: 55 deg. F.
      c. In areas scheduled for finish trades, such as acoustic tile, resilient tile, woodwork, and the like, for 48 hours before they begin, during the installation work and for at least 48 hours after its completion: 60 deg. F. See individual manufacturers’ product data for additional requirements and standards.
      d. General Contractor to control humidity levels in store during construction operations per manufacturers recommendations.

C. Light and Power - General Contractor shall extend electric service from an acceptable source. General Contractor will pay cost of electrical energy consumed. General Contractor shall provide temporary lighting along corridors and within all open spaces, and such lights necessary for stairs and other means of egress. General Contractor shall provide temporary power outlets for the convenience of all trades using tools and appliances noted as fractions of a horsepower. Separate polyphase service completely fused or equipped with circuit breakers shall be provided for equipment and tools which have motors 5 HP or under, and for temporary power required to operate the permanent heating system as the means of temporary heating should permanent electrical connections not be completed when such use of permanent heating is required. Welding shall not be performed through the use of the temporary electrical service. Welding shall require separate equipment, fuel attendances and other incidentals related to supplying power for welding purposes. General Contractor to provide all new service as shown.

D. Sanitary Facilities - Until sufficient permanent plumbing and water supply work is completed to provide temporary toilet facilities within the building, the General Contractor shall provide and maintain approved temporary facilities on the site. Toilet facilities shall be kept clean and sanitary, and screened against insects. When possible, and where directed, General Contractor shall provide temporary sanitary facilities within the building employing flushing type water closets and lavatories with suitable partitioning to provide privacy and ventilation. Plumbing fixtures used shall be replaces with new fixture prior to final inspection of project.

E. Storage Sheds - General Contractor shall be responsible for providing and maintaining sheds and shanties. Obtain necessary approvals such as may be required by zoning or other ordinances and locate where directed. Remove such facilities when no longer required and when directed.

F. Field Office - General Contractor shall provide a suitable office for use of his supervisory force and that of DSG. A large trailer shall be acceptable. The Field Office shall be located where directed by DSG and shall be removed when suitable space within the building can be used as field office space.

G. Telephone - General Contractor shall provide a private telephone and fax machine for his use and the use of DSG and their agents. DSG shall reimburse the General Contractor for toll and long distance calls made from this telephone. All other subcontractors shall be provided with a pay telephone located in a convenient place or near the field office.

H. Provide the computer and telephone capabilities: Conference calls, e-mail, fax, and digital camera functions.

**1.16 CONTRACT CLOSEOUT**

A. Final Closeout Submittals: Before final Application for Payment will be approved, the following submittals must be received from the General Contractor and approved by DSG. If General Contractor fails to provide a fully completed Closeout Document Book within sixty (60) days after Substantial Completion of the Work, then the General Contractor agrees to pay DSG the sum of two hundred fifty dollars ($250.00) per day, as liquidated damages and not as a penalty, until the fully completed Closeout Document Book is received by DSG. In submitting the Closeout Document book, the General Contractor shall bind the closeout documents in a “Closeout Document Book,” consisting of a three-ring binder with tab for each category from the GC/LL Close out document checklist to be submitted to DSG Construction Project Manager. The Closeout Documents shall include the following additional items to the GC/LL Closeout document checklist with final payment (See attached GC/LL Closeout Documents Checklist - Appendix D).
   1. Copy of Certificate of Occupancy (attached to final invoice).
   2. Final lien waivers from General Contractor and all Subcontractors. Affidavit of Total Release and Certification of all Bills Paid); included in the Contract Documents.
   3. Completed Operations Bond (copy or original Performance and Payment Bond) if applicable.
   4. Certificate of Completion, Appendix G.

B. All change orders must be fully executed and returned to DSG Construction Coordinator before final payment will be released.

C. Closeouts must be complete and accepted by DSG before final payment will be released.

**1.17 CHASES AND OPENINGS**

A. The General Contractor and subcontractors will construct chases and openings required for their own work and for that of other trades from information obtained from the various trades and subcontractors.

B. Where any information for chases and openings is received too late and requires cutting to produce it, the cost of the cutting shall be borne by the trade or subcontractor needing the same.

C. Any such cutting will require the AOR’s prior approval, and in no case may such cutting be done in a manner of location that would endanger the structural quality of the building.

**1.18 EXAMINATION OF SITE**

A. Submission of any proposal, directly or indirectly in connection with this work shall imply that such bidder has examined the premises and has satisfied himself as to existing conditions under which he will be obliged to operate should he be awarded work under this contract. No extra charge will be allowed for failure of any bidder to examine the site.

## 1.19 LINES, LEVELS AND MEASUREMENTS

A. All trades shall work accurately to proper lines and levels, and to plumb or construct slopes as the drawings require, verifying dimensions and locations of their work with the General Contractor's superintendent.

B. Data which may show on drawings concerning underground conditions and contours are not guaranteed by the AOR, but must be verified by each subcontractor as it pertains to their work.

C. The General Contractor and each trade shall verify measurements at the site before ordering materials or performing their work. No extra charges will be allowed for differences between actual measurements and dimensions shown; however, such differences shall be referred to the AOR for consideration before proceeding with the work.

## 1.20 COOPERATION AND COORDINATION

A. All trades and the General Contractor shall cooperate with one another toward the most efficient approach and performance of all work, discussing proposed work at job conferences, giving information to each other of work intended for the week following, and otherwise making known all conditions in advance. All work shall be maintained on schedule.

## 1.21 SCHEMATIC AND DIAGRAMMATIC INDICATIONS

A. If difficult conditions or interferences of various trades occur, all facts shall be given to the AOR for a decision, especially where appearance of the work may be involved.

B. The need for chases and openings not shown on the drawings shall always be determined in advance of such building construction.

## 1.22 USE OF SITE

A. Use of the site by the various subcontractors shall be at Owner's (See Section 00550 for definition) and/or DSG's discretion on all matters and in which they deem necessary to place restrictions.

B. Parking of workmen's automobiles will be confined to certain areas. Egress to and from the site shall be as directed.

## 1.23 TESTING AND INSPECTING MATERIALS

A. All materials shall conform to standard specification requirements, tests, quantities, and qualities, as determined by the American Society of Testing Materials (ASTM). Manufacturers of material shall furnish samples and/or certified copies of mill and shop tests without cost, as required by the AOR. Samples of materials and work if and when requested by the AOR or as herein after specifically stated shall be submitted to an independent testing laboratory and the costs of such tests will be paid by the General Contractor.

## 1.24 SEWER LOCATIONS

A. The General Contractor and Plumbing Subcontractors shall check the fall of the sewers to the manholes included in this work as indicated on the drawings. General Contractors shall verify all grades and elevations shown. Also included in this work; tie-ins into existing sewer lines and for these lines reused, General Contractor will have these lines video taped with camera to identify and correct potential problems within the lines.

## 1.25 TEMPORARY DRAINAGE

A. The General Contractor shall keep excavations and building free from water to protect all work and to afford satisfactory working conditions, for execution of all branches of all contract divisions of the work until completion.

B. Provide any temporary trenches, sumps, pumps, or other equipment of facilities necessary for such drainage.

## 1.26 CLEANING UP

A. Each trade shall keep the premises free from rubbish and debris resulting from its own work, included is the hauling from the premises of crating, cartons, scraps, defective materials, and surplus materials so that a clean job exists at all times. This will be rigidly enforced.

## 1.27 TAXES

A. The General Contractor shall pay all applicable taxes, Federal, State, and local: and maintain payroll record certificates in conformance with all applicable Federal, State and Local laws.

## 1.28 OCCUPANCY

A. Upon completion of the work, the General Contractor shall remove all waste materials, rubbish, tools, and construction equipment, machinery and surplus materials from and about the premises. The General Contractor shall replace any broken glass, remove paint spots and smears from all surfaces, clean all windows and leave the building cleaned in accordance with Section 01740. All utilities shall be permanently connected and operational before possession by Owner (See Section 00550 for definition) and/or DSG. Drives, walks and ground improvements necessary for customer and store service traffic shall be completed prior to possession by DSG. All handicapped requirements must meet all prevailing codes. General Contractor must secure Occupancy Permit prior to fixturing.

B. “Substantial Completion” means: the structure has been completed, permanently enclosed, completely decorated both inside and out, all floor coverings installed; the electrical and mechanical systems have been completely installed, and are fully functioning under EMS controls; all utilities have been permanently hooked up; the toilet facilities are completed; the fire and theft protection systems have been completely installed and are capable of being monitored; all site work has been completed including landscaping, curbing, paving and stripping, and all necessary permits and approvals have been obtained so as to permit the installation of fixtures and the stocking of merchandise, and so that DSG may use and enjoy the structure as intended. This is subject only to minor punch list items that do not affect use, enjoyment, or occupancy permits.

## 1.29 PROJECT IDENTIFICATION SIGN

A. The Landlord and/or General Contractor shall furnish, erect and maintain a project sign on site, located in a prominent location. The sign shall be erected within 10 days of approval to start project by DSG’s Project Construction Manager and removed three (3) days before the store opening date.

B. The sign is to be constructed of exterior grade plywood and shall be properly braced and constructed to suit field conditions. See Appendix 1 Drawing from Image One for sign specifics.

C. LL/GC to hang 5’ x 25’ Coming Soon banner from building once shell is erected and in a prominent location as directed by DSG Construction Project Manager.

D. Mall Barricades - LL/GC to hang graphic from Image One at location as directed by DSG Construction Project Manager.

## 1.30 WARRANTY

A. The General Contractor shall warrant all equipment, materials, and workmanship for a period of one (1) year minimum from lease turnover date or contract completion date. (See Specifications Sections for warranties). It is understood that the failure of any piece of equipment, material, or service provided in this contract to pass the applicable inspection by both parties and ordinance authorities will constitute a default in performance and the General Contractor warrants that in the event of such failure, he will cause same to be corrected expeditiously and in a manner acceptable to such authorities and Owner (See Section 00550 for definition) and/or DSG. If the General Contractor does not provide corrections within a reasonable period of time (10 days) the Owner (See Section 00550 for definition) may provide the corrections and chargeback the General Contractor for all costs incurred. See Section 01788 for additional requirements. Items deemed by DSG to be emergency items due to safety or interruption of normal operations of the store are required to be corrected in 24 hours.

B. General Contractor shall provide to Owner (See Section 00550 for definition) and DSG a list of names, addresses, and current telephone numbers of all subcontractors used for construction and services of demised premises by the proposed fixture date. The General Contractor and all Subcontractors must submit warranty form (item D. below).

C. The General Contractor shall correct any work or defects found not to be in accordance with the contract documents within the warranty period and shall bear all costs of correction.

D. General Contractor's Warranty Form and Subcontractor's Warranty Form for use with this section. Warrant all labor and material and/or labor when material is provided under NAV.

**1.31 SUBCONTRACTOR WARRANTY FORM**

PROJECT

LOCATION

OWNER

GENERAL CONTRACTOR

We_____, Subcontractor for

as described in Specification Section(s)_____ (Trade)

(List appropriate Sections of Specifications)

Do hereby warrant that all labor and materials furnished and work performed in conjunction with the above referenced project are in accord with the Contract Documents and authorized modifications thereto, and will be free from defects due to defective materials or workmanship for a period of_____Year(s) from Date of Substantial Completion. This warranty commences on _____( Lease turn over date or Contract completion date) And expires on (Expiration Date)

Should any defect develop during the warranty period due to improper materials, workmanship or arrangement, the same shall upon written notice by Dick's, be made good by the undersigned at no expense to Dick's.

**NOTHING IN THE ABOVE SHALL BE DEEMED TO APPLY TO WORK WHICH HAS BEEN ABUSED OR NEGLECTED BY DICK'S.**

DATE: _____FOR

(Company Name)

**By:**

TITLE:

(Officer of Company)

**1.32 CONTRACTOR WARRANTY FORM**

PROJECT

LOCATION

OWNER

GENERAL CONTRACTOR

We_____General Contractor_____(Company Name)

for the above referenced project, do hereby warranty that all labor and materials furnished and work performed are in accord with the Contract Document and authorized modifications thereto, will be free from defects due to defective materials for workmanship for a period of one year from day of occupancy. This warranty commences on _____ and expires on _____ (One Year from lease turnover or contract completion date).

Should any defect develop during warranty period due to improper materials, workmanship or arrangement the same shall upon written notice by Dick's be made good by the undersigned at no expense to Dick's.

Nothing in the above shall be deemed to apply to work which has been abused or neglected by Dick's.

DATE:_____FOR
(Company Name))

BY

TITLE
(Officer of Company)

**1.33 UNIONIZED AREA**

A. If in a unionized area, provide the following "work harmony" clause:
   1. It is understood that Union and Non-Union/Open Shop Contractors/Subcontractors will be working on this site simultaneously for both site work and building work and this subcontractor and its' subcontractors agree to work in harmony with other contractors, whether Union or Non-Union/Open Shop. There shall be no picketing, work stoppages, etc. that may impact the work of this project.

**1.34 ADDITIONAL GENERAL CONTRACTOR REQUIREMENTS:**

A. Subcontractors to prepare "Applications for Payment" for their respective work scopes with "Schedule of Values."

B. Any building component, whether new or existing, installed or disturbed as a result of this subcontractor's efforts will be made public-ready at the completion of each work day.

**1.35 ATTIC STOCK**

A. Please get with the store manager on where he/she would like these items stored.
   1. One sealed box of EACH type of floor covering.
   2. One sealed box of ceiling tile
   3. One full quart of each type of paint used in the building. Each can shall be clearly marked with the Sherwin Williams name and the number as it refers to the plans.
   4. Five extra track heads.

B. Items shall be neatly stacked on a pallet until directed by the DSG Construction Project Manager to a permanent storage location.

**END OF SECTION**

**SECTION 01 1000**

**SUMMARY**

## PART 1 GENERAL

### 1.01 PROJECT

A. Project Name: Dick's Sporting Goods, The Shops at Blackstone Valley, Millbury, MA.

B. Architect's Name: Onyx Creative, Inc.

C. The Project consists of the renovation of an existing single level DSG retail space for creation of a new footwear department and associated storage.

### 1.02 SCOPE

A. The Work of this Contract shall include the furnishing of all labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, insurance, taxes, superintendence, coordination and miscellaneous services required for the construction and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated into the Work. All Work shall be performed in strict accordance with the Contract Documents.

B. In the event of conflict within the Contract Documents or within these Specifications, the provisions of the more stringent, as determined by the DSG's Construction Project Manager, shall govern.

### 1.03 WORK OF OTHER RELATED SECTIONS

A. All other sections and documents contained herein also including the Contract Drawings.

### 1.04 OWNER OCCUPANCY

A. Owner intends to occupy the Project upon Substantial Completion.
   1. PARTIAL OCCUPANCY
      a. DSG reserves the right of partial occupancy or use of facilities, services, and utilities, prior to Substantial Completion, without implying completion or acceptance of any part of the Work.
      b. The General Contractor shall provide access to the building for DSG's personnel and provide heating, ventilating, and air conditioning, and electricity.
      c. Providing restoration and repair of damage resulting from partial occupancy or use shall not be at the expense of the General Contractor.
      d. The General Contractor shall permit DSG to place and install, or to have other Contractors place and install, as much equipment during the progress of the Work as is possible before the final acceptance of the Work, and shall coordinate such placing and installation of the equipment so that it does not interfere with the progress of the Work or any portion of it.

B. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.

C. Schedule the Work to accommodate Owner occupancy.

### 1.05 CONTRACTOR USE OF SITE AND PREMISES

A. General Contractor shall have complete and exclusive use of the immediate premises for execution of the Work.

B. Construction Operations: Limited to areas noted on Drawings.
   1. Locate and conduct construction activities in ways that will limit disturbance to site.
   2. Coordinate all construction operations to minimize conflict and to facilitate usage and access to their businesses

C. Provide access to and from site as required by law and by Owner:

1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
2. Do not obstruct roadways, sidewalks, or other public ways without permit.
3. Do not load structure, new or existing, with weight that will endanger structure.
4. Do not unreasonably encumber site with materials or equipment.

D. Utility Outages and Shutdown:
1. Limit disruption of utility services to hours the building is unoccupied.
2. Do not disrupt or shut down life safety systems, including but not limited to fire sprinklers and fire alarm system, without 7 days notice to Owner and authorities having jurisdiction.
3. Prevent accidental disruption of utility services to other facilities.

**1.06 SITE INVESTIGATION**

A. The General Contractor acknowledges that they are satisfied as to the nature and location of the Work, the general and local conditions, particularly those bearing upon transportation, disposal, handling and storage of materials, availability of labor, water, electric power, roads and uncertainties of weather, ground water table or similar physical conditions at the site, the conformation and condition of the ground, existing conditions of all structures, improvements, building systems, etc., the character, quality and quantity of surface and subsurface materials to be encountered, the character of equipment and facilities needed prior to and during the prosecution of the Work, the impact and extent of the work on existing structures, equipment and systems, and all other matters which can in any way affect the Work or the cost thereof under this Contract. Any failure by the General Contractor to be acquainted with all the available information concerning site conditions will not relieve their responsibility for estimating properly the difficulty or cost of successfully performing the Work.

**1.07 HAZARDOUS MATERIALS**

A. Do not incorporate hazardous materials or products in the Work as currently defined in the Resource Conservation and Recovery Act of 1976 (RCRA), the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), or Environmental Protection Agency (EPA) regulations, rules, or requirements, as amended, unless the Contract Documents give no other option than to provide a material or product which contains a hazardous material, component, constituent, waste, or leachate.

B. Report in writing at once to the Owner (See 00 7100 for definition) the discovery of any product or material (whether new or already existing on the Project) which contains hazardous materials, components, constituents, waste, or leachate.

C. Do not incorporate in the Work any products or materials which contains concentrations of a constituent, component, or material above the threshold levels which would require adherence to hazardous waste disposal regulations as currently defined, or could cause a release or threat or release of a hazardous substance at a level that would require a remedial response or removal action as currently defined by RCRA, CERCLA, or the EPA.

D. Select materials and products meeting specified requirements that comply with EPA requirements as regards hazardous materials content. Determined that materials and products proposed for substitution comply with RCRA, CERCLA, and EPA requirements.

**1.08 PROTECTION REQUIREMENTS FOR NEW AND EXISTING CONSTRUCTION**

A. Protect any new or existing construction and building from wind, storms, cold heat, water and dust damage of any sort. Provide all equipment and enclosures to maintain this protection and keep the building interior free of water and dust during the life of the Contract.

B. Provide all shoring and bracing required to maintain the integrity and the safety of the existing structure and for the proper execution of the Work.

C. Exercise the utmost care to protect all existing utility lines from damage during the progress of the Work..

D. Before work begins provide and erect all necessary fences, warning signals, signs and lights. Provide continued maintenance during the progress of the Work. The extent of this protection and the details of construction shall be in accordance with the requirements of all state and local codes.

E. Any portion of the existing building or existing utility services damaged because of failure to provide the required protection shall be removed and replaced with new materials and construction at the General Contractor's expense. This work shall be accomplished subject to the Owner's (See Section 00 7100 for definition) approval.

**1.09 REPLACEMENT AND REPAIR OF ANY STRUCTURES THAT HAVE BEEN DESTROYED IN THE PROGRESS OF THE WORK**

A. Because of the installation of the new items of equipment, fixtures, materials, etc., that are required by the Work, it shall become necessary to remove portions of the existing structure, equipment, and/or utility services. Unless specifically noted otherwise on the Drawings, the General Contractor shall be responsible for replacing, in a condition of identical appearance, construction, design, working order, and strength as its previous state, any such portion of the existing structure, equipment, and/or utility services so required to be disturbed. The replaced item shall meet the approval of the Owner (See Section 00 7100 for definition) before final approval of the Work.

**1.10 RECORD DOCUMENT SUBMITTALS**

A. General: As work progresses, prepare and maintain record documents as specified herein. Each record shall be certified by the General Contractor. Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location accessible to the Owner (See Section 00 7100 for definition) for reference during normal working hours. Upon completion, turn record documents over to DSG's Construction Project Manager.

B. Record drawings: Maintain a set of contract drawings (including amendment and change order drawings) and shop drawings in clean, undamaged condition, with mark-up of actual installations which vary from the work as originally shown. Mark drawing most capable and accurately of showing "field" condition fully; cross-reference at corresponding location on plan drawings. Mark with red erasable pencil and use other colors to distinguish between variations in separate categories of work. Mark-up new information in color that is recognized to be of importance, but was for some reason not shown on either contract drawings or shop drawings. Give particular attention to concealed work, which would be difficult to measure and record at a later date. Note related change order number where applicable. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on cover of each set.

C. Record specification: Maintain one copy of specifications, including amendments, change orders and similar notifications issued in printed form during construction, and mark-up variations in actual work in comparison with text of specifications and modifications as issued. Give particular attention to substitutions, selection of options, and similar information on work where it is concealed or cannot otherwise be readily discerned at a later date by direct observation. Note related record drawing information and product data, where applicable.

D. Record product data, certifications and laboratory test reports: Maintain one copy of each product data submittal, product certification, and laboratory test report and mark-up significant variations in actual work in comparison with submitted information. Include both variations in product as delivered to site, and variations from manufacturer's instructions and recommendations for installation. Give particular attention to concealed products and portions of the work that cannot otherwise be readily discerned at a later date by direct observation. Note related change orders and mark-up of record drawings and specifications.

E. Record sample submittal: Immediately prior to date(s) of substantial completion, DSG's Construction Project Manager or designated representatives will meet with the General Contractor at the site, and will determine which (if any) of submitted samples maintained during

progress of the work are to be retained. Comply with DSG's instructions for packaging, identification marking, and delivery.

F. Project Closeout Photos: The General Contractor is required to take the following digital closeout photographs as indicated on the attached Appendix B-1"Project Closeout Photos Required", B-2 "Branded Wall at Mall Project Closeout Photos Required", and B-3 "Branding Area Project Closeout Photos Required". The digital photographs shall be sent via email to the DSG Construction Project Manager. Digital photographs shall be received by DSG no later than 12:00 PM on the Friday preceding the Soft Opening. The General Contractor will coordinate the scheduling for taking the photographs with the DSG Construction Project Manager.

**END OF SECTION**

**SECTION 01 2500**

**SUBSTITUTION PROCEDURES**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Procedural requirements for proposed substitutions.

### 1.02 DEFINITIONS

A. Substitutions: Changes from Contract Documents requirements proposed by Contractor to materials, products, assemblies, and equipment.
   1. Substitutions for Cause: Proposed due to changed Project circumstances beyond Contractor's control.
      a. Unavailability.
      b. Regulatory changes.

### 1.03 LIMITATIONS ON SUBSTITUTIONS

A. Substitutions shall be submitted to the Architect of Record and DSG Construction Project Manager.

B. Substitutions will only be considered seven (7) days prior to the Bid Date. After 7 days, substitutions will only be considered and reviewed by the AOR at an hourly rate that shall be charged to the person/firm making the substitution request.

C. Substitutions will not be considered unless the "Substitution Request Form - Section 01631" attached in this Project Manual is used and the requirements of this section and Section 01631 are fully complied with. Other types of forms are not acceptable. Substitutions must be approved by DSG.

D. Substitutions will not be considered when indicated on shop drawings or product data submittals without separate formal request complying with "submittal procedures" specified in this section.

E. Substitutions will not be considered unless submitted through the General Contractor.

F. If the General Contractor proposes to substitute any material, fixtures, article, device, method of construction, arrangement of components, or other items that differ from that called for in the Contract Documents, he shall include all costs involved including work required by other contractors or subcontractors affected by the substitution.
   1. The General Contractor shall additionally include cost for additional studies, investigation, submittals, redesign and/or analysis that is necessitated by DSG.
   2. Provide drawings, cuts, manufacturer’s information, performance data and all other information necessary for evaluation.

G. Substitute products shall not be ordered or installed without written acceptance from DSG.

H. Only one request for substitution for each product will be considered. When substitution is not accepted by DSG, provide the specified product.

I. DSG will determine the acceptability of all substitutions.

### 1.04 REQUESTS FOR SUBSTITUTIONS

A. Contractor's Representation:
   1. Request for substitution constitutes a representation that the General Contractor has investigated the proposed product and has determined that it is equal to or superior in all respects to the specified product.
   2. Request for substitution constitutes a representation that the General Contractor will provide same type of warranty for substitution as for specified product. General Contractor's warranty shall be in writing guaranteeing all substituted products have same or superior performance as the product specified.

3. Request for substitution constitutes a representation that the General Contractor will coordinate the installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects.
4. Request for substitution constitutes a representation that the General Contractor waives all claims for additional costs related to substitutions.
5. Request for substitution constitutes a representation that the cost data is complete and includes all related cost under his Contract, but excludes any approved AOR's design fees required by substitution.
6. Request for substitution constitutes a representation that the General Contractor has thoroughly investigated the proposed substitute to determine if license fees and royalties are pending on the proposed substitute, for compliance with the General Conditions of the Contract AIA A-201.

B. Requests for substitutions shall be submitted on "Substitution Request Form - Section 01631" attached in this Project Manual. Legible copies of this form shall be complete with data substantiating compliance of proposed substitution with requirements of Contract Documents including the following information:
1. Project title and AOR's project number.
2. Identification of product specified including Specifications Section and Paragraph Number.
3. Identification of proposed substitute complete with manufacturer's name and address, trade name of product, and model or catalog number. Attach product data.
4. List of fabricator and supplier (with address and phone number) for proposed substitute.
5. The affect of substitution on dimensions, material thicknesses, wiring, piping, ductwork, etc. indicated in Contract Documents.
6. The affect of substitution on other trades.
7. The affect of substitution on construction schedule.
8. Differences in quality and performance between specified product and proposed substitute.
9. Comparison of manufacturer's guarantees of specified product and proposed substitute.
10. Availability of maintenance services and replacement materials for proposed substitute.
11. Cost data comparing proposed substitute with specified product, and amount of net change to Contract Sum.
12. License fees and/or royalties pending on proposed substitute.

## PART 2 PRODUCTS - NOT USED

## PART 3 EXECUTION

### 3.01 GENERAL REQUIREMENTS

A. A Substitution Request for products, assemblies, materials, and equipment constitutes a representation that the submitter:
1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product, equipment, assembly, or system.
2. Agrees to provide the same warranty for the substitution as for the specified product.
3. Agrees to provide same or equivalent maintenance service and source of replacement parts, as applicable.
4. Agrees to coordinate installation and make changes to other work that may be required for the work to be complete, with no additional cost to Owner.
5. Waives claims for additional costs or time extension that may subsequently become apparent.
6. Agrees to reimburse Owner and Architect for review or redesign services associated with re-approval by authorities.

B. A Substitution Request for specified installer constitutes a representation that the submitter:
1. Has acted in good faith to obtain services of specified installer, but was unable to come to commercial, or other terms.

C. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Burden of proof is on proposer.
   1. Note explicitly any non-compliant characteristics.

D. Content: Include information necessary for tracking the status of each Substitution Request, and information necessary to provide an actionable response.
   1. Forms indicated in the Project Manual are adequate for this purpose, and must be used.

E. Limit each request to a single proposed substitution item.
   1. Submit an electronic document, combining the request form with supporting data into single document.

**3.02 SUBSTITUTION PROCEDURES DURING CONSTRUCTION**

A. Submittal Form (after award of contract):
   1. Submit substitution requests by completing the form immediately following this section. See this section for additional information and instructions. Use only this form; other forms of submission are unacceptable.

B. Submit request for Substitution for Cause within 14 days of discovery of need for substitution, but not later than 14 days prior to time required for review and approval by Architect, in order to stay on approved project schedule.

C. Substitutions will not be considered under one or more of the following circumstances:
   1. When they are indicated or implied on shop drawing or product data submittals, without having received prior approval.
   2. Without a separate written request.

**3.03 RESOLUTION**

A. Architect may request additional information and documentation prior to rendering a decision. Provide this data in an expeditious manner.

B. Architect will notify Contractor in writing of decision to accept or reject request.
   1. Architect's decision following review of proposed substitution will be noted on the submitted form.

**3.04 ACCEPTANCE**

A. Accepted substitutions change the work of the Project. They will be documented and incorporated into work of the project by Change Order, Construction Change Directive, Architectural Supplementary Instructions, or similar instruments provided for in the Conditions of the Contract.

**3.05 CLOSEOUT ACTIVITIES**

A. See Section 01 7800 - Closeout Submittals, for closeout submittals.

B. Include completed Substitution Request Forms as part of the Project record. Include both approved and rejected Requests.

**END OF SECTION**

**SECTION 01 2550**

**SUBSTITUTION REQUEST FORM**

This form is to be sent to the AOR for approval and is part of the substitution requirements specified in Section 01630.

PROJECT TITLE & NO. _____

TO: Architect of Record (AOR)_____
Address_____
_____
Telephone _____
Fax_____
E-mail_____

ATTN: _____

SPECIFIED ITEM _____
Section_____ Paragraph

PROPOSED SUBSTITUTE _____

_____
Attach complete description, catalog, spec data, and laboratory tests if applicable.

1. What effect will substitution have on dimensions, gauges, weights, etc. indicated in Contract Documents?

_____

_____

2. What effect will substitution have on wiring, piping, duct work, etc. indicated in Contract Documents?

_____

_____

3. What effect will substitutions have on other trades?_____

_____

4. What effect will substitution have on construction schedule? _____

_____

5. What are the differences in quality and performance between proposed substitute and specified product?

_____

_____

6. Manufacturer's guarantees of the specified products and proposed products are:

Same:_____Different (Explain)_____

7. List (on separate sheet) the availability of maintenance services and replacement materials for proposed substitute.

8. List (on separate sheet) names, addresses and phone numbers of fabricators and suppliers for proposed substitutes.

9. If the substitution request is accepted, it will result in:
No cost impact_____Credit (How much) _____

Added cost (How much)_____

10. There are ___ are not ___ license fees and royalties pending on the proposed substitute. (Explain)

_____

11. The undersigned shall pay for additional studies, investigations, submittals, redesign and/or analysis by the Architect/Engineer caused by the requested substitutions.

SUBMITTED BY: (Contractor)

Firm _____

Address _____

_____

Signature _____

Telephone No._____Date

Submitted for review by Architect.

_____

_____

Date _____

**********

AOR/EOR'S REVIEW COMMENTS:

____ Accepted
____ Accepted as Noted (see attached copy)
____ Rejected due to incomplete form. Resubmit.
____ Not Accepted
____ Received Too Late

Signature _____

Date _____

Remarks _____

END OF SECTION

THIS PAGE IS BLANK

**SECTION 01 3000**

**ADMINISTRATIVE REQUIREMENTS**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. General administrative requirements.

B. Construction progress schedule.

C. Progress photographs.

D. Submittals for review, information, and project closeout.

E. Number of copies of submittals.

F. Requests for Interpretation (RFI) procedures.

G. Submittal procedures.

### 1.02 GENERAL ADMINISTRATIVE REQUIREMENTS

A. Conform to requirements of Section 01 7000 - Execution and Closeout Requirements for coordination of execution of administrative tasks with timing of construction activities.

B. Make the following types of submittals to Architect:
   1. Requests for Interpretation (RFI).
   2. Requests for substitution.
   3. Shop drawings, product data, and samples.
   4. Test and inspection reports.
   5. Manufacturer's instructions and field reports.
   6. Applications for payment and change order requests.
   7. Progress schedules.
   8. Coordination drawings.
   9. Correction Punch List and Final Correction Punch List for Substantial Completion.

### 1.03 DESCRIPTION:

A. Work included:
   1. Wherever possible, throughout the Contract Documents, the minimum acceptable quality of workmanship and materials has been defined either by manufacturer's name and catalog number or by reference to recognized industry standards.
   2. To ensure that the specified products are furnished and installed in accordance with the design intent, procedures have been established for advance submittal of design data and for its review or rejection by the AOR.

B. Submittal schedule: Within 15 days of the Notice to Proceed, the General Contractor shall provide to DSG and the AOR a complete schedule of proposed submittals. Provide anticipated submittal dates and correlate to the Work progress. Form of schedule shall be satisfactory to DSG and the AOR.

### 1.04 SHOP DRAWINGS:

A. Unless otherwise specifically directed by the AOR, make all Shop Drawings accurately to a scale sufficiently large to show all pertinent features of the item and its method of connection to the Work.

B. 4 prints shall be submitted of each shop drawing. After the shop drawing has been reviewed and stamped, the print will be filed at the office of the AOR, and one copy returned to the General Contractor, from which to make as many copies as needed for the prosecution of the Work. The AOR will not return multiple copies of shop drawings.
   1. AOR may return shop drawings without a stamp if submitted products or documents are Not Subject to Review.

C. Shop Drawings may be submitted to the AOR electronically via email or other file sharing service previously approved by AOR. It is the General Contractor's responsibility to confirm delivery to intended recipient.

**1.05 PRODUCT DATA:**

A. Two copies of product data shall be submitted of each item/product. After the item/product has been reviewed and stamped, the copy will be filed at the office of the AOR, and one copy returned to the General Contractor, from which they shall make as many copies as needed for the prosecution of the Work. The AOR will not return multiple copies of the product data.

B. Information not exclusively pertinent to the Project shall be deleted so that there is no possible area of confusion as to what product, series, or model is to be examined. The AOR or Owner (See Section 00 7100 for definition) will not take responsibility for having examined a product that was not intended by the General Contractor to be judged.

**1.06 SAMPLES, MOCKUPS AND COLORS:**

A. Unless otherwise specifically directed by the AOR, all samples, mockups and colors shall be of the precise article proposed to be furnished.

B. Samples and mockups shall faithfully represent the product or the assembly as it is proposed to be installed. This shall include, but not be limited to, materials, finishes, method of construction or assembly, relationship to adjacent construction, method of attachment to adjacent construction, plus any electrical or mechanical connection that are required for the product or assembly to function.

C. Unless the precise color and pattern is specifically described in the Contract Documents, whenever a choice of color or pattern is available in a specified product submit accurate color charts and pattern charts to the AOR for review and selection.

D. Samples and color charts shall be physical specimens of materials or colors proposed to be provided. Selections and review of samples will be made by the AOR from submitted samples and color charts, without increase in costs to the Owner (See Section 00550 for definition) or AOR. Should the General Contractor desire a sample returned, submit a sufficient number for the AOR to retain one (1) sample and return the remainder to the General Contractor.

E. In order for the AOR to make the color selections as quickly as possible and to avoid delivery and pricing problems, the General Contractor shall be required to submit all items within 40 days of the Notice to Proceed. Delivery and pricing problems that develop because an item was not submitted within the forty (40) day time limit, shall be the sole responsibility of the General Contractor and not the owner.

F. The color selection will not be made until after samples of all items that require a color selection have been submitted.

**1.07 MAINTENANCE AND OPERATION MANUALS:**

A. Provide information for DSG’s maintenance of each system or operating equipment, including, but not limited to, lubrication, emergency control, parts replacement, spare parts inventory recommendation, listing of tools and accessories needed for maintenance and similar instructions, TAB test reports and other test reports, and including warranty and requirements indicated throughout the Specification.

B. Provide manufacturer's operating instructions for each item of mechanical equipment and supplement with additional instructions where necessary. Prepare and submit specific operating instructions for each mechanical system that involves multiple items of equipment, including instructions for charging, start-up, control or sequencing or operation, phase or seasonal variations, shut-down, safety, and similar operational instructions. Prepare in typewritten form, completely explained and easily understood.

C. Organize each maintenance manual to include an index followed by thumb tab marked sections for system operating instructions; emergency instructions including addresses and telephone numbers for service sources; regular system maintenance procedures including lubrication; spare parts listing and stocking recommendations, inspection, adjusting, re-balancing, cleaning,

parts replacement, and similar maintenance instructions and recommendations. Manuals shall also include the proper use of tools and accessories; valve schedules and control diagram for each system; manufacturer's data for each operational item in each system; manufacturer's product warranties, and warranties relating to system and equipment items as part of the Work; shop drawings relating to the system, test reports, and Project Record Documents. Bind each maintenance manual in one or more black vinyl covered, 2" thick, three ring binder, plus pocket folder type binders for folded drawings, and mark the back spine of each binder with system identification and volume number.

**1.08 ADDITIONAL REQUIREMENTS FOR MECHANICAL AND ELECTRICAL:**

A. Prior to submitting shop drawings, assure that equipment proposed for use will fit into space available, considering space for coil removal, filter service, maintenance, and other activities required to keep equipment operating in proper manner.

B. Note in "red" all deviations in electrical and/or mechanical arrangement from that indicated, including, but not limited to, such items as electrical loads, electrical connections and physical size. It is understood when submittal is received that all items that effect other trades have been coordinated with those trades.

C. Submittal data shall include, but is not limited to the following:
   1. Arrangement drawings with complete dimensional data.
   2. Performance data listing the following:
      a. Capacities, CFM, GPM, entering and leaving air and water conditions, pressure losses for air and water side and all component pressure losses.
      b. Horse power, KW, and total unit electrical requirements.
      c. Fan curves, discharge arrangement, motor locations, sheaves and belt data.
      d. Power and control wiring diagrams, showing interlock requirements.
      e. Isolators and isolator location with selection data.
      f. Filter data with type, size number required and pressure drop.
      g. Auxiliary equipment by other manufacturers: Provide name, capacity, dimensions, wiring diagrams and power requirements.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION**

**3.01 CONSTRUCTION PROGRESS SCHEDULE**

A. If preliminary schedule requires revision after review, submit revised schedule within 10 days.

B. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
   1. Include written certification that major contractors have reviewed and accepted proposed schedule.

C. Within 10 days after joint review, submit complete schedule.

D. Submit updated schedule with each Application for Payment.

**3.02 PROGRESS PHOTOGRAPHS**

A. Submit photographs as part of weekly progress report required by Appendix E of the Specifications.

B. Submit new photographs weekly, within 1 day after exposure.

C. Photography Type: Digital; electronic files.

D. Digital Photographs: 24 bit color, minimum resolution of 1024 by 768, in JPG format; provide files unaltered by photo editing software.
   1. Delivery Medium: Via email and to be submitted to DSG as required by Appendix E of the Specifications.
   2. File Naming: Include project identification, date and time of view, and view identification.
   3. PDF File: Assemble all photos into printable pages in PDF format, with 2 to 3 photos per page, each photo labeled with file name; one PDF file per submittal.

### 3.03 REQUESTS FOR INTERPRETATION (RFI)

A. Definition: A request seeking one of the following:
   1. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in the Contract Documents.
   2. A resolution to an issue which has arisen due to field conditions and affects design intent.

B. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of the Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
   1. Prepare a separate RFI for each specific item.
      a. Review, coordinate, and comment on requests originating with subcontractors and/or materials suppliers.
      b. Do not forward requests which solely require internal coordination between subcontractors.
   2. Combine RFI and its attachments into a single electronic file. PDF format is preferred.

C. Reason for the RFI: Prior to initiation of an RFI, carefully study all Contract Documents to confirm that information sufficient for their interpretation is definitely not included.
   1. Include in each request Contractor's signature attesting to good faith effort to determine from the Contract Documents information requiring interpretation.
   2. Unacceptable Uses for RFIs: Do not use RFIs to request the following::
      a. Approval of submittals (use procedures specified elsewhere in this section).
      b. Approval of substitutions (see Section - 01 6000 - Product Requirements)
   3. Improper RFIs: Requests not prepared in conformance to requirements of this section, and/or missing key information required to render an actionable response. They will be returned without a response.
   4. Frivolous RFIs: Requests regarding information that is clearly indicated on, or reasonably inferable from, the Contract Documents, with no additional input required to clarify the question. They will be returned without a response.

D. Content: Include identifiers necessary for tracking the status of each RFI, and information necessary to provide an actionable response.
   1. Official Project name and number, and any additional required identifiers established in Contract Documents.
   2. Owner's, Architect's, and Contractor's names.
   3. Discrete and consecutive RFI number, and descriptive subject/title.
   4. Issue date, and requested reply date.
   5. Reference to particular Contract Document(s) requiring additional information/interpretation. Identify pertinent drawing and detail number and/or specification section number, title, and paragraph(s).
   6. Annotations: Field dimensions and/or description of conditions which have engendered the request.
   7. Contractor's suggested resolution: A written and/or a graphic solution, to scale, is required in cases where clarification of coordination issues is involved, for example; routing, clearances, and/or specific locations of work shown diagrammatically in Contract Documents. If applicable, state the likely impact of the suggested resolution on Contract Time or the Contract Sum.

E. Attachments: Include sketches, coordination drawings, descriptions, photos, submittals, and other information necessary to substantiate the reason for the request.

F. RFI Log: Prepare and maintain a tabular log of RFIs for the duration of the project.
   1. Indicate current status of every RFI. Update log promptly and on a regular basis.
   2. Note dates of when each request is made, and when a response is received.

G. Review Time: Architect will respond and return RFIs to Contractor within two calendar days of receipt. For the purpose of establishing the start of the mandated response period, RFIs received after 12:00 noon will be considered as having been received on the following regular working day.
   1. Response period may be shortened or lengthened for specific items, subject to mutual agreement, and recorded in a timely manner in progress meeting minutes.

H. Responses: Content of answered RFIs will not constitute in any manner a directive or authorization to perform extra work or delay the project. If in Contractor's belief it is likely to lead to a change to Contract Sum or Contract Time, promptly issue a notice to this effect, and follow up with an appropriate Change Order request to Owner.
   1. Response may include a request for additional information, in which case the original RFI will be deemed as having been answered, and an amended one is to be issued forthwith. Identify the amended RFI with an R suffix to the original number.
   2. Do not extend applicability of a response to specific item to encompass other similar conditions, unless specifically so noted in the response.
   3. Upon receipt of a response, promptly review and distribute it to all affected parties, and update the RFI Log.
   4. Notify Architect within two calendar days if an additional or corrected response is required by submitting an amended version of the original RFI, identified as specified above.

**3.04 SUBMITTAL SCHEDULE**

A. Submit to Architect for review a schedule for submittals in tabular format.
   1. Coordinate with Contractor's construction schedule and schedule of values.
   2. Format schedule to allow tracking of status of submittals throughout duration of construction.
   3. Arrange information to include scheduled date for initial submittal, specification number and title, submittal category (for review or for information), description of item of work covered, and role and name of subcontractor.
   4. Account for time required for preparation, review, manufacturing, fabrication and delivery when establishing submittal delivery and review deadline dates.
      a. For assemblies, equipment, systems comprised of multiple components and/or requiring detailed coordination with other work, allow for additional time to make corrections or revisions to initial submittals, and time for their review.

**3.05 SUBMITTALS FOR REVIEW**

A. When the following are specified in individual sections, submit them for review:
   1. Product data.
   2. Shop drawings.
   3. Samples for selection.
   4. Samples for verification.

B. Submit to Architect for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.

C. Samples will be reviewed for aesthetic, color, or finish selection.

D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 7800 - Closeout Submittals.

**3.06 SUBMITTALS FOR INFORMATION**

A. When the following are specified in individual sections, submit them for information:
   1. Design data.
   2. Certificates.
   3. Test reports.
   4. Inspection reports.
   5. Manufacturer's instructions.
   6. Manufacturer's field reports.

7. Other types indicated.

B. Submit for Architect's knowledge as contract administrator or for Owner.

### 3.07 SUBMITTALS FOR PROJECT CLOSEOUT

A. Submit Correction Punch List for Substantial Completion.

B. Submit Final Correction Punch List for Substantial Completion.

C. When the following are specified in individual sections, submit them at project closeout in conformance to requirements of Section 01 7800 - Closeout Submittals:
   1. Project record documents.
   2. Operation and maintenance data.
   3. Warranties.
   4. Other types as indicated.

D. Submit for Owner's benefit during and after project completion.

### 3.08 NUMBER OF COPIES OF SUBMITTALS

A. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.

B. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.
   1. After review, produce duplicates.
   2. Retained samples will not be returned to Contractor unless specifically so stated.

### 3.09 SUBMITTAL PROCEDURES

A. General Requirements:
   1. Use a single transmittal for related items.
   2. Submit separate packages of submittals for review and submittals for information, when included in the same specification section.
   3. Sequentially identify each item. For revised submittals use original number and a sequential numerical suffix.
   4. Identify: Project; Contractor; subcontractor or supplier; pertinent drawing and detail number; and specification section number and article/paragraph, as appropriate on each copy.
   5. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and Contract Documents.
      a. Submittals from sources other than the Contractor, or without Contractor's stamp will not be acknowledged, reviewed, or returned.
      b. By approving and submitting submittals, the General Contractor represents that they have verified all materials, field measurements, and field construction criteria related thereto, and that they have checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents
   6. Deliver each submittal on date noted in submittal schedule, unless an earlier date has been agreed to by all affected parties, and is of the benefit to the project.
      a. Send submittals in electronic format via email to Architect.
   7. Schedule submittals to expedite the Project, and coordinate submission of related items.
      a. For each submittal for review, allow 10 days excluding delivery time to and from the Contractor.
      b. For sequential reviews involving Architect's consultants, Owner, or another affected party, allow an additional 7 days.
   8. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.
   9. Provide space for Contractor and Architect review stamps.
   10. When revised for resubmission, identify all changes made since previous submission.

11. Distribute reviewed submittals. Instruct parties to promptly report inability to comply with requirements.
12. Incomplete submittals will not be reviewed, unless they are partial submittals for distinct portion(s) of the work, and have received prior approval for their use.
13. Submittals not requested will be recognized, and will be returned "Not Reviewed"
14. The General Contractor shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents by the AOR's review of submittals unless the General Contractor has specifically informed the AOR in writing of such deviation at the time of submission and the AOR has given written approval to the specific deviation. The General Contractor shall not be relieved from responsibility for errors or omissions in the submittals by the AOR's review thereof.
15. Verbal discussion between the General Contractor, the Owner (See Section 00 7100 for definition), DSG or the AOR of a proposed deviation and any subsequent agreements thereto shall not be considered valid unless confirmed in writing by DSG and/or the AOR.
16. Wherever any product is specified in accordance with the Federal Specifications, an ASTM Standard, a United States Standard Specification, or other association standard, the General Contractor shall present an affidavit from the manufacturer certifying that the product complies with the particular standard specification. Where necessary and requested or specified, support test data shall be submitted to substantiate compliance.

B. Submittal Log:
   1. Maintain an accurate submittal log for the duration of the construction period, showing status of all submittals of all types.
   2. General Contractor generated submittal matrix of all submittals with date each item shall be maintained and submitted if requested.
   3. Make the log and submittal matrix available to the AOR for review upon request

C. Product Data Procedures:
   1. Submit only information required by individual specification sections.
   2. Collect required information into a single submittal.
   3. Do not submit (Material) Safety Data Sheets for materials or products.

D. Shop Drawing Procedures:
   1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting the Contract Documents and coordinating related work.
   2. Do not reproduce the Contract Documents to create shop drawings.
   3. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.

E. Samples Procedures:
   1. Transmit related items together as single package.
   2. Identify each item to allow review for applicability in relation to shop drawings showing installation locations.

**3.10 COORDINATION OF SUBMITTALS:**

A. Prior to submittal for AOR's review, use all means necessary to fully coordinate all material, including, but not limited to, the following procedures:
   1. Determine and verify all field dimensions and conditions, catalog numbers, and similar data.
   2. Coordinate as required with all Trades and with all public agencies involved.
   3. Secure all necessary approval from public agencies and others; signify by stamp or other means that all required approvals have been obtained.
   4. Clearly indicate, in writing, all deviations from the Contract Document.

B. Mechanical and electrical coordination:
   1. Provide coordination of structural, ductwork, waste, vent, pipes and conduit, as necessary to provide ceiling heights required. Provide necessary information to AOR if relocation of services and/or ceiling height changes will have to be made.

2. Provide scaled equipment layout of mechanical room showing dimensioned equipment pads; floor drain locations; sleeve locations; and equipment location showing required code or service clearance.

**3.11 SUBMITTAL REVIEW**

A. Submittals for Review: Architect will review each submittal, and approve, or take other appropriate action.

B. Submittals for Information: Architect will acknowledge receipt and review. See below for actions to be taken.

C. Architect's actions will be reflected by marking each returned submittal using virtual stamp on electronic submittals.
   1. Notations may be made directly on submitted items and/or listed on appended Submittal Review cover sheet.

D. Architect's and his consultants' actions on items submitted for review:
   1. Authorizing purchasing, fabrication, delivery, and installation:
      a. "Approved", or language with same legal meaning.
      b. "Approved as Noted, Resubmission not required", or language with same legal meaning.
         1) At Contractor's option, submit corrected item, with review notations acknowledged and incorporated.
   2. Not Authorizing fabrication, delivery, and installation:
      a. "Revise and Resubmit".
         1) Resubmit revised item, with review notations acknowledged and incorporated.
         2) Non-responsive resubmittals may be rejected.
      b. "Rejected".
         1) Submit item complying with requirements of Contract Documents.

E. Architect's and his consultants' actions on items submitted for information:
   1. Items for which no action was taken:
      a. "Received" - to notify the Contractor that the submittal has been received for record only.
   2. Items for which action was taken:
      a. "Reviewed" - no further action is required from Contractor.

**END OF SECTION**

**SECTION 01 4000**

**QUALITY REQUIREMENTS**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Submittals.

B. Quality assurance.

C. References and standards.

D. Testing and inspection

E. Control of installation.

F. Manufacturers' field services.

G. Defect Assessment.

### 1.02 REFERENCE STANDARDS

A. ASTM C31 - Standard Practice for Making and Curing Concrete Test Specimens in the Field

B. ASTM C1077 - Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation; 2016.

C. ASTM C1093 - Standard Practice for Accreditation of Testing Agencies for Masonry; 2015a.

D. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction; 2012a.

E. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection; 2014a.

F. ASTM E699 - Standard Specification for Agencies Involved in Testing, Quality Assurance, and Evaluating of Manufactured Building Components; 2016.

G. IAS AC89 - Accreditation Criteria for Testing Laboratories; 2010.

### 1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Test Reports: After each test/inspection, promptly submit two copies of report to Architect and to Contractor.

1. Include:
    a. Date issued.
    b. Project title and number.
    c. Name of inspector.
    d. Date and time of sampling or inspection.
    e. Record of temperature and weather conditions
    f. Identification of product and specifications section.
    g. Location in the Project.
    h. Type of test/inspection.
    i. Date of test/inspection.
    j. Results of test/inspection.
    k. Conformance with Contract Documents.
    l. When requested by Architect, provide interpretation of results.
2. Test report submittals are for Architect's knowledge as contract administrator for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents, or for Owner's information.
3. Testing Agency to distribute electronically all reports and tests to those parties listed in this section.
    a. Written reports shall be distributed within three (3) days of testing and inspections. Distribute reports to each of the following:

1) Owner (See Section 00 7100 for definition).
2) DSG Construction Project Manager.
3) Architect of Record: One (1) copy.
4) General Contractor: Two (2) copies. * One (1) Home Office, * One (1) Field Office
5) Building Official: Number as required.
6) Structural Engineer: One (1) copy.

C. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.
   1. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

**1.04 QUALITY ASSURANCE**

A. Testing Agency Qualifications:
   1. Prior to start of Work, submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.
   2. Qualification Statement: Provide documentation showing testing laboratory is accredited under IAS AC89.
   3. Agency's professional engineer shall be registered and licensed in the state in which the project is located.
   4. The test reports will be signed by a qualified professional, registered in the state that the project is being constructed.
   5. Methods of testing shall conform to the latest published requirements of the American Society of Testing and Materials and pertinent codes and regulations.

**1.05 REFERENCES AND STANDARDS**

A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.

C. Obtain copies of standards where required by product specification sections.

D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.

E. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.

F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Architect shall be altered from the Contract Documents by mention or inference otherwise in any reference document.

**1.06 TESTING AND INSPECTION**

A. Owner will employ and pay for services of an independent testing agency to perform specified testing and inspection.

B. The Independent Testing Agency will be retained by the Owner (see section 00 7100 for definition). More than one ITC may be retained to perform these services. The ITC shall perform, but not be limited to, the following project testing and inspection services:
   1. Soils
   2. Paving (Concrete/Asphalt)
   3. Foundations
   4. Concrete Testing and Placement, including Tilt-Up concrete panels, if applicable.
   5. Reinforcing Steel (except mill reports)
   6. Floor flatness and levelness (if requested by DSG).

7. Structural Steel (except mill reports)
8. Bolting
9. Slab Moisture Testing
10. Masonry

C. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION**

**3.01 CONTROL OF INSTALLATION**

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.

D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Have Work performed by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

**3.02 TESTING AND INSPECTION**

A. See individual specification sections for testing and inspection required.

B. Testing Agency Duties:
1. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
2. Perform specified sampling and testing of products in accordance with specified standards.
3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
4. Promptly notify Architect and Contractor of observed irregularities or non-conformance of Work or products.
5. Perform additional tests and inspections required by Architect.
6. Submit reports of all tests/inspections specified.
7. Distribute written reports.
8. Pier Logs (if required) shall be submitted for all pier inspections
9. A final inspection report shall be submitted by the Testing Agency stating compliance / non-compliance with project construction documents.
10. Testing Agency shall contact Architect for current set of construction drawings and specifications existing prior to starting work.
11. The services of the Testing Agency, and the information provided by the Testing Agency, are provided for the sole benefit of the Owner and DSG. The General Contractor shall not rely upon any information provided by the Testing Agency. General Contractor is solely responsible for assuring that the Work complies with the Contract Documents in all respects and may not rely on the Testing Agency for this, or any other assurance. The Testing Agency 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 General Contractor, or be a party to the scheduling of the Work. The Testing Agency is not an authorized agent of the Owner (See Section 00 7100 for definition).

C. Independent Testing Agency Insurance Requirements:
   1. 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 $2,000,000 and Professional Liability insurance with limits of not less than $2,000,000 and shall furnish Owner (See Section 00 7100 for definition) with a certificate to verify insurance policies are in force prior to commencing any activity. Such Commercial General Liability policy shall name Owner (See Section 00 7100 for definition) and DSG as an additional insured. ITC shall be responsible for any and all claims, injuries or damages of any type whosoever including, but not limited to, injuries to persons, property and loss of lie, arising out of, relating to and due directly or indirectly from its services hereunder and shall indemnify, protect, defend and hold Owner (See Section 00 7100 for definition) and DSG 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 (See Section 00 7100 for definition) and DSG. This indemnity shall survive the termination of this agreement.

D. Limits on Testing/Inspection Agency Authority:
   1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
   2. Agency may not approve or accept any portion of the Work.
   3. Agency may not assume any duties of Contractor.
   4. Agency has no authority to stop the Work.

E. Contractor Responsibilities:
   1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
   2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
   3. Provide incidental labor and facilities:
      a. To provide access to Work to be tested/inspected.
      b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
      c. To facilitate tests/inspections.
      d. To provide storage and curing of test samples.
   4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
   5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
   6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
   7. General Contractor is responsible for coordinating with the Testing Agency so that no work is installed without the proper tests being performed. Testing Agency scheduling shall be a minimum of 24 hours advance of operations to allow the assignment of personnel to conduct the testing.
   8. General Contractor shall provide and pay for all project required concrete mix designs, and mortar and grout mix designs. Concrete mix design shall have records of confirmed cylinders and certification by a Registered Engineer for each grade of concrete.
   9. General Contractor shall furnish copies of mill test reports of all shipments of cement and reinforcing steel to the Architect and the Testing Agency as required.
   10. General Contractor shall advise Testing Agency, in advance, of sources of material, and instruct supplier to cooperate with Testing Agency to achieve required inspection.

11. General Contractor shall notify the Testing Agency a minimum of 24 hours in advance of operations to allow Testing Agency to assign personnel and schedule testing.
12. Contractor shall make arrangements and schedule the proper authorities for inspection of the structure, soils and construction materials.
13. General Contractor shall obtain from governing authorities the proper test procedures that are required for the system.
14. Where results of required inspection, tests or similar services, prove unsatisfactory and do not indicate compliance of with the requirements of the Contract Documents, at the Owner's discretion, the costs of tests associated with that non-compliance will be deducted by the owner from the Contract Sum.
15. General Contractor shall secure and deliver to the Testing Agency, without cost, preliminary representative samples of materials that are proposed for use and that require testing for compliance with the project specifications.
16. General Contractor shall furnish such labor as is necessary to obtain and handle samples at the project or at other sources of materials.
17. General Contractor shall provide and maintain for the sole use of testing laboratory, 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.
18. General Contractor shall supply Testing Agency with copies of the following shop drawings prior to start of work.
    a. Concrete / Asphalt mix designs.
    b. Structural including steel, reinforcing, masonry.
    c. Masonry grout / mortar mix designs (if applicable).

F. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Architect.

G. Re-testing required because of non-conformance to specified requirements shall be paid for by Contractor.

**3.03 INDEPENDENT TESTING AGENCY SCOPE OF SERVICES**

A. Site mass earthwork soils:
1. A pre-construction site meeting shall be held with the General Contractor and the earthwork subcontractor to discuss any questions they may have in reference to the soil recommendations, site preparation, positive drainage and storm water control, and any other pertinent issues that could affect the schedule and cost of the project. DSG's Construction Project Manager should schedule and attend this meeting to make sure the contractors are aware of the importance of the meeting. The Testing Agency firm must attend the meeting.
2. Stripping, grubbing and demolition activities are to be observed to make sure the Geotechnical Engineering recommendations are followed. Items to be demolished or grouted in-place are to be observed to make sure the plans and specifications are followed. Items to be removed are to be documented (i.e. foundations, septic fields, etc.).
3. Soil density testing is to be conducted as material is placed and compacted, both natural and fill soil. If soils are too wet or are not being compacted to meet the intent of the project specifications, the areas should be identified in the reports. The Testing Agency should be prepared to visit the site and assess what needs to be done to help the progress of the project. The time frame for such a response is immediate, and cannot wait a week. DSG's Construction Project Manager should be contacted on all items that will impact to the schedule. Keep them informed through their voice mail, mobile phone and email system.
4. Unsuitable soil conditions need to be defined as to why they are unsuitable and where they are located. If soils are simply wet, and are of suitable classification, that needs to be clearly stated in field reports. The drawings should be utilized to identify locations of unsuitable or wet soil conditions. A copy of the drawing should be attached to daily field report identifying the location of the unsuitable or wet soil conditions. The report should provide options to stabilize the soil conditions, or if additional evaluation is required to

assess the problem. DSG's Construction Project Manager should be contacted for any items that will be detrimental to the schedule. DSG expects the Testing Agency to be able to quantify unsuitable soil removal, and identify why it is considered unsuitable. Testing Agency will be asked to review change orders on soil issues.

5. Site preparation for positive drainage and protection of the site should be a major inspection task for Testing Agency field personnel. The Testing Agency is to be pro-active in discussing and identifying these potential problem areas. If low areas on the site are continuously holding water, DSG's Construction Project Manager and the General Contractor should be advised of the potential long term problems.
6. One (1) compaction test is required for every 100 LF of utility pipe backfill and each manhole/storm inlet. The soils are to be tested as lifts are placed and compacted. The lift thickness should be in accordance with the project specifications. Additional lifts should not be placed until acceptable results are obtained. Field reports need to identify if trenches are left open and soils are being saturated due to the exposure to weather. The General Contractor needs to be informed of these issues so subcontractors may be put on notice.
7. The erosion control plan should be reviewed by the Testing Agency, and the on-site Testing Agency technician should observe erosion control measures for compliance with the project requirements and government standards. If non-compliant items are observed, the General Contractor and DSG's Construction Project Manager. The General Contractor is responsible for maintaining and quality control of the erosion control methods. The Owner (See Section 00 71000 for definition), DSG and Testing Agency will not be held responsible for NPDES violations.

B. Pavement section testing:
   1. Base course material is to be tested for in-place density and thickness. The material should be tested for gradation and classification. The material physical properties shall be tested to see if they meet specified bearing requirements.
   2. Asphalt wearing course material should be tested for compaction during placement and thickness measurements should be conducted during lay-down. The temperature of the asphalt mixture should be taken and compared with the asphalt mixture design range. The screed/laydown thickness should be between 1/8 to 3/16 inches greater than the required asphalt layer requirement. Therefore, if the screed depth is set for the exact thickness as specified, inform the General Contractor that the asphalt thickness may be deficient if a minimum thickness is specified. If there are areas in which the thickness is questionable, the field report should identify those areas by an attached drawing. If any paving is being conducted in cold weather, asphalt temperatures are below or above the design mix range, or screed depths are not in compliance with thickness requirements, the General Contractor and DSG's Construction Project Manager shall be notified immediately. Paved Areas holding water after asphalt placement should be identified on a drawing and the General Contractor notified to make repairs to eliminate ponding areas.
   3. Concrete for pavements should be inspected and sampled as it is placed. The load transfer devices, if required, should be observed for proper placement and installation procedures. Construction joints should be cut at the proper time period, and the depth of the saw cut and the spacing of the saw cut should be observed and reported. Non-compliance items are to be well documented; the General Contractor and DSG's Construction Project Manager should be notified if the same non-compliant items are regularly occurring.

C. Foundation testing:
   1. Foundation excavations are to be measured for size and depth. One (1) compaction test per 100 LF of the foundations excavations and at each column foundation shall be made. Testing Agency shall enforce the specifications and identify foundation excavations not filled the same day, or protected against weather. It is the General Contractor's responsibility to excavate and replace soils saturated by heavy rains when foundation excavation is left open and unprotected from heavy rains. The Testing Agency field report

shall clearly identify when the General Contractor leaves the footing excavation exposed and unprotected over night to the weather.

D. Slab subgrade soil testing:
   1. One (1) compaction test per 5000 SF of slab on grade subgrade should be conducted prior to stone placement and/or vapor barrier placement. The grading should be observed for uniformity, and the General Contractor should be employ a surveyor to insure proper grading has been achieved.

E. Aggregate base-slab on ground vapor break:
   1. The aggregate base beneath the slab should be measured for thickness and density. If the subgrade soils were not fine graded uniformly, the aggregate base should be checked thoroughly. The vapor barrier should be observed for proper placement, lapping and jointing. Punctures are to be properly repaired prior to concrete placement.

F. Slab-on-ground thickness and inspections:
   1. Slab on ground thickness should be measured from the formwork prior to concrete placement. The specifications and drawings provide the minimum thickness allowed. The load transfer devices and reinforcing should be inspected for placement and securement. Construction Joints/Saw cuts for the slab need to be completed in accordance with the plans and specifications for time of application, depth and placement. The curing techniques of the slab require observation for compliance with the project specifications. For other testing requirements for slab on grades, see section 3.03 G.

G. Concrete slabs on ground-general:
   1. Tests and inspections noted in Table C1 are to be done by the Testing Agency. The Testing Agency shall keep records of the testing and inspections.
   2. Laboratory Testing Requirements:
      a. Proportion concrete materials on basis of laboratory trial batches in accordance with ACI 318.
      b. Ready-mix concrete supplier can proportion materials per ACI 318.
      c. Proportioning by water-cement ratio, per ACI 318, is not acceptable.
      d. Submit copies of data and test results to AOR for review to substantiate mix designs.
   3. Field testing:
      a. Perform tests noted in Table C1 and provide test reports with the location of each placement represented to the local Building Official and DSG's Construction Project Manager.
      b. For slabs, perform slump and temperature tests for first truck-load of concrete and every SIXTH truck MINIMUM thereafter. Provide test reports to those indicated above.
      c. When pumping concrete, take samples for tests at point of delivery from pumping line.
   4. Test floor slab finished surfaces for Flatness and Levelness if "requested by DSG."
      a. Test random traffic areas shown on drawings in accordance with ASTM E1155, except as specified herein.
         1) Random Traffic Areas F-Number Requirements:
            (a) Slabs on Ground: F35/Fl25 minimum overall for composite of measured values for entire day's concrete placement; F25/Fl20 minimum for any individual floor section.
            (b) 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.
         2) 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 ¼" maximum elevation change within 2 feet of columns or walls that pass through slab surface.

(c) Ensure top of entire floor falls within + or - 3/4 of an inch of finished floor elevation indicated on Drawings.
(d) Complete testing, identify defective areas, and give verbal report within 24 hours after placement.
(e) Submit written report by within 36 hours after placement. Include costs for retesting defective areas replaced or repaired.

H. Structural Steel Framing Inspection Services
1. Structural steel inspection and testing will include 100% visual observations of weld quality, weld location, bearing for joists, securement of perimeter angle, bolt tightness, bridging placement, lapping and securement (note the tails are not to be welded until the dead load is applied), metal decking securement (the puddle weld and screw placement is not typical per the Metal Deck Institute). A punch list of non-complying items should be provided to the DSG PM. At close out, all defective items shall be corrected or verified with engineer and inspecting agency that this is acceptable. The welder's certification needs to be accepted by the General Contractor and ITC. Uncertified welders shall not be allowed to weld on the project until they meet the proper certification requirements

I. Slab Moisture Testing:
1. Perform a minimum of ten (10) Calcium chloride tests within 30 days of install.
2. Perform a minimum of ten (10) pH tests within 30 days of install.
3. Copies of all Calcium Chloride and pH test reports must be provided to DSG Construction Project Manager.

**3.04 SPECIAL INSPECTIONS**

A. Special Inspections requirements are to follow these current building code and drawings.

**3.05 MANUFACTURERS' FIELD SERVICES**

A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.

B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

**3.06 DEFECT ASSESSMENT**

A. Replace Work or portions of the Work not conforming to specified requirements.

**END OF SECTION**

## SECTION 01 5000
## TEMPORARY FACILITIES AND CONTROLS

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Dewatering

B. Temporary utilities.

C. Temporary telecommunications services.

D. Temporary sanitary facilities.

E. Temporary Controls: Barriers.

F. Security requirements.

G. Project identification sign.

H. Field offices.

### 1.02 SUMMARY

A. The General Contractor shall pay all energy costs for the temporary electricity, heat and ventilation used for the Work. This shall include the costs of installation and maintenance of temporary equipment, which costs shall be the responsibility of the General Contractor. The General Contractor shall remove all temporary equipment at the end of each work phase.

B. Use of alternate temporary facilities is General Contractor's option, and subject to the AOR's acceptance.

C. Comply with all Federal, State and local codes/regulations.

### 1.03 CONSTRUCTION AIDS

A. Provide hoisting equipment, scaffolding, etc. as needed to properly perform his work.

### 1.04 DEWATERING

A. Provide temporary means and methods for dewatering all temporary facilities and controls.

B. Maintain temporary facilities in operable condition.

C. Provide and operate drainage and pumping equipment as may be necessary for the proper performance of this Work. Maintain the site free from water resulting from the operation of the dewatering equipment on the construction work area and adjacent site areas.

### 1.05 TEMPORARY UTILITIES

A. Provide and pay for all electrical power, lighting, water, heating and cooling, and ventilation required for construction purposes.

B. See Section 00 9500 for additional information and requirements.

### 1.06 TELECOMMUNICATIONS SERVICES

A. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization.

B. See Section 00 9500 for additional information and requirements.

### 1.07 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.

B. Maintain daily in clean and sanitary condition.

C. See Section 00 9500 for additional information and requirements.

### 1.08 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect

existing facilities and adjacent properties from damage from construction operations and demolition.

B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.

C. Provide protection for plants designated to remain. Replace damaged plants.

D. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

E. As the General Contractor finds it necessary to remove portions of the barricades to perform operations, provide all necessary warnings, temporary guard rails and other safety measures required, and replace the temporary barricade as soon as practical, and at the end of each work day. Should the General Contractor fail to replace the barricade as required, then the Owner (See Section 00 7100 for definition) may do so without notice to the General Contractor, and back-charge the General Contractor for the full cost of providing these barricades.

F. Provide barricades with warning lights at locations where their operations present a safety hazard to adjacent users.

**1.09 SECURITY**

A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.

B. In addition to placing the permanent fire protection facilities in operating condition at the earliest feasible date, provide fire extinguishers of types and sizes recommended by NFPA No. 10 for the general construction areas. The extinguishers will be located on each story of construction, near each entrance and stairway.

C. Provide similar fire extinguishers for specific areas of work.

D. Smoking will not be allowed in the building.

E. General Contractor to provide and pay for watchman services as deem appropriate and necessary for protection of construction site and materials.

F. Coordinate with Owner's security program.

**1.10 PROJECT IDENTIFICATION**

A. See Section 00 9500 for additional information and requirements.

B. No other signs are allowed without Owner permission except those required by law.

**1.11 FIELD OFFICES**

A. Office: Weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture, drawing rack, and drawing display table.

B. See Section 00 9500 for additional information and requirements.

**1.12 PROTECTION OF FINISHED WORK**

A. Be wholly responsible for the protection of the finished Work, except to the extent covered by Property Insurance to be maintained by Owner (See Section 00 7100 for definition).

B. Upon completion of the Work and before acceptance, the General Contractor shall, without extra compensation, repair and/or refinish any work that may have been damaged.

**1.13 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS**

A. Remove temporary utilities, equipment, facilities, materials, prior to Date of Substantial Completion inspection.

B. Remove underground installations to a minimum depth of 2 feet. Grade site as indicated.

C. Clean and repair damage caused by installation or use of temporary work.

D. Restore existing facilities used during construction to specified or original condition.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SECTION**

**SECTION 01 6000**

**PRODUCT REQUIREMENTS**

## PART 1 GENERAL

### 1.01 SUBMITTALS

A. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

B. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

C. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
   1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

## PART 2 PRODUCTS

### 2.01 NEW PRODUCTS

A. Provide new products unless specifically required or permitted by the Contract Documents.

B. DO NOT USE products having any of the following characteristics:

C. Where all other criteria are met, Contractor shall give preference to products that:
   1. If used on interior, have lower emissions, as defined in Section 01 6116.
   2. If wet-applied, have lower VOC content, as defined in Section 01 6116.
   3. Have a published GreenScreen Chemical Hazard Analysis.

### 2.02 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.

C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

## PART 3 EXECUTION

### 3.01 SUBSTITUTION PROCEDURES

A. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.

B. A request for substitution constitutes a representation that the submitter:
   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
   2. Agrees to provide the same warranty for the substitution as for the specified product.
   3. Agrees to coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
   4. Waives claims for additional costs or time extension that may subsequently become apparent.

### 3.02 TRANSPORTATION AND HANDLING

A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.

B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.

C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.

D. Transport and handle products in accordance with manufacturer's instructions.

E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.

F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.

H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

**3.03 STORAGE AND PROTECTION**

A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.

B. Store and protect products in accordance with manufacturers' instructions.

C. Store with seals and labels intact and legible.

D. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.

E. For exterior storage of fabricated products, place on sloped supports above ground.

F. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.

G. Comply with manufacturer's warranty conditions, if any.

H. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

I. Prevent contact with material that may cause corrosion, discoloration, or staining.

J. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

K. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

**END OF SECTION**

**SECTION 01 7000**

**EXECUTION AND CLOSEOUT REQUIREMENTS**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.

B. Requirements for alterations work, including selective demolition.

C. Cutting and patching.

D. Cleaning and protection.

E. Starting of systems and equipment.

F. Demonstration and instruction of Owner personnel.

G. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.

H. General requirements for maintenance service.

I. Guarantees and Warranties

### 1.02 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
   1. Structural integrity of any element of Project.
   2. Integrity of weather exposed or moisture resistant element.
   3. Efficiency, maintenance, or safety of any operational element.
   4. Visual qualities of sight exposed elements.
   5. Work of Owner or separate Contractor.

C. Project Record Documents: Accurately record actual locations of capped and active utilities.

### 1.03 QUALIFICATIONS

A. For demolition work, employ a firm specializing in the type of work required.
   1. Minimum of 3 years of experience.

B. For design of temporary shoring and bracing, employ a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

### 1.04 PROJECT CONDITIONS

A. Use of explosives is not permitted.

B. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.

C. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.

D. Perform dewatering activities, as required, for the duration of the project.

E. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

F. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.

G. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
   1. Minimize amount of bare soil exposed at one time.
   2. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.
   3. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.

4. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

**1.05 COORDINATION**

A. See Section 01 1000 for occupancy-related requirements.

B. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

C. Notify affected utility companies and comply with their requirements.

D. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

E. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on drawings. Follow routing indicated for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

F. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

G. Coordinate completion and clean-up of work of separate sections.

H. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

**1.06 FINAL CLEANING**

A. Scheduling the final cleaning prior to AOR's final inspection will be the responsibility of the General Contractor.

B. In addition to cleanup requirements stated elsewhere, the General Contractor shall:
   1. Perform cleaning operations exactly as detailed in the Specifications below.
   2. Remove temporary protection and labels not required to remain.
   3. Remove debris, rubbish, dirt, etc., resulting from the Contractors work from all areas including concealed spaces, chases, and above ceilings.
   4. Remove debris, rubbish, etc. resulting from the General Contractors work, from roofs and drainage systems.

**PART 2 PRODUCTS**

**2.01 PATCHING MATERIALS**

A. New Materials: As specified in product sections; match existing products and work for patching and extending work.

B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.

**2.02 MATERIALS FOR CLEANING**

A. Use only cleaning materials recommended by manufacturer of surface to be cleaned.

B. Use cleaning materials only on surfaces by cleaning material manufacturer.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.

E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

**3.02 PREPARATION**

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

**3.03 GENERAL INSTALLATION REQUIREMENTS**

A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.

B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

E. Make neat transitions between different surfaces, maintaining texture and appearance.

**3.04 ALTERATIONS**

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
   1. Verify that construction and utility arrangements are as indicated.
   2. Report discrepancies to Architect before disturbing existing installation.
   3. Beginning of alterations work constitutes acceptance of existing conditions.

B. Remove existing work as indicated and as required to accomplish new work.
   1. Remove items indicated on drawings.
   2. Relocate items indicated on drawings.
   3. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.
   4. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.

C. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove, relocate, and extend existing systems to accommodate new construction.
   1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.
   2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.
   3. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
      a. Disable existing systems only to make switchovers and connections; minimize duration of outages.
      b. Provide temporary connections as required to maintain existing systems in service.

4. Verify that abandoned services serve only abandoned facilities.
5. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification; patch holes left by removal using materials specified for new construction.

D. Protect existing work to remain.
1. Prevent movement of structure; provide shoring and bracing if necessary.
2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
3. Repair adjacent construction and finishes damaged during removal work.

E. Adapt existing work to fit new work: Make as neat and smooth transition as possible.

F. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.

G. Refinish existing surfaces as indicated:
1. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.
2. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.

H. Clean existing systems and equipment.

I. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.

J. Do not begin new construction in alterations areas before demolition is complete.

K. Comply with all other applicable requirements of this section.

**3.05 CUTTING AND PATCHING**

A. Whenever possible, execute the work by methods that avoid cutting or patching.

B. See Alterations article above for additional requirements.

C. Perform whatever cutting and patching is necessary to:
1. Complete the work.
2. Fit products together to integrate with other work.
3. Provide openings for penetration of mechanical, electrical, and other services.
4. Match work that has been cut to adjacent work.
5. Repair areas adjacent to cuts to required condition.
6. Repair new work damaged by subsequent work.
7. Remove samples of installed work for testing when requested.
8. Remove and replace defective and non-conforming work.

D. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.

E. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.

F. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

G. Restore work with new products in accordance with requirements of Contract Documents.

H. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

I. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material , to full thickness of the penetrated element.

J. Patching:

1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
2. Match color, texture, and appearance.
3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

**3.06 PROGRESS CLEANING**

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Keep streets clean from mud, dirt, debris and other materials. Promptly remove from streets, mud and dirt tracked by vehicles.

C. Wet down dry materials and rubbish as necessary to prevent dust. Schedule cleaning operation so dust and debris resulting from the cleaning process does not damage other work.

D. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

E. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

F. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

G. Do not dispose of volatile waste in storm drains or sanitary sewers.

H. Comply with rules/regulations regarding hazardous materials and:
1. Store volatile wastes in covered metal containers and remove from premises daily.
2. Prevent accumulation of waste that might cause hazardous conditions.
3. Provide adequate ventilation during use of volatile and noxious substances.

I. Unless otherwise stated, provide on site containers for collection of waste materials, debris, and rubbish. Containers must have adequate capacity to accommodate General Contractor's needs. Provide for removal of containers at appropriate intervals so that containers do not overflow.

J. Provide containers at workers break and lunch area. Police the area daily.

**3.07 PROTECTION OF INSTALLED WORK**

A. Protect installed work from damage by construction operations.

B. Provide special protection where specified in individual specification sections.

C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

G. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

**3.08 SYSTEM STARTUP**

A. Coordinate schedule for start-up of various equipment and systems.

B. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.

C. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

D. Verify that wiring and support components for equipment are complete and tested.

E. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.

F. Submit a written report that equipment or system has been properly installed and is functioning correctly.

**3.09 DEMONSTRATION AND INSTRUCTION**

A. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at equipment location.

B. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.

C. Provide a qualified person who is knowledgeable about the Project to perform demonstration and instruction of Owner's personnel.

**3.10 ADJUSTING**

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

**3.11 FINAL CLEANING**

A. Use cleaning materials that are nonhazardous.

B. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.

C. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.

D. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

E. Clean filters of operating equipment.

F. Clean debris from roofs, gutters, downspouts, scuppers, overflow drains, area drains, drainage systems, and _____.

G. Clean site; sweep paved areas, rake clean landscaped surfaces.

H. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

I. General Cleaning:
   1. Conduct pre-cleaning walk through of store to determine existing defects and damage. If non-cleaner punch list items create need for repeat work, an additional charge may be assessed.
      a. Any charge backs or additional charges will be pre-approved by cleaner and DSG.

J. Exclusions:
   1. Construction debris or dumpster removal.
      a. Out of scope work such as power washing exterior walkways, exterior signs , vent and return grills, removal of plastic coverings/packaging, etc., will be quoted on a case by case basis. If Union Labor is required, adjust rates accordingly.

K. Area Cleaning Schedule:
   1. Entrance To Store (Vestibule And Front Tile Area):
      a. Sweep and damp mop (wood) / wet mop (tile) floor and vacuum carpet.
      b. Vacuum walk-off mats, if applicable.
      c. Clean door track/threshold
      d. Clean front door glass.
      e. Clean security sensors.
   2. Water Fountain (If Applicable):
      a. Clean, polish and sanitize water fountains.

b. Sanitize with bleach.

3. Stock Room and Mezzanine:
   a. Dry vacuum all shelving and concrete floor.
   b. Wipe clean shelves and frames
   c. Auto scrub and damp mop all concrete floors
4. Restrooms:
   a. Clean and sanitize full restroom including toilets/urinals, sinks, doors, mirrors, fixtures, push plates, handles, dispensers and partitions.
   b. Wipe clean walls as necessary.
   c. Clean baseboards and edges.
   d. Remove all trash from the restroom.
   e. Preliminary supply dispensers (initial stock only) with soap, toilet tissue, sanitary napkins, paper towels and liners for receptacles.
   f. Seal ceramic tile grout.
5. Escalator (If Applicable):
   a. Clean and polish handrails, glass and ledges.
   b. Vacuum escalator steps and landing.
6. Elevator (If Applicable):
   a. Clean and polish wall panels, rails and interior/exterior doors.
   b. Sweep and damp mop (wood) / wet mop (tile) floor or vacuum carpet.
7. Stairwell Cleaning (If Applicable):
   a. Sweep or dry vacuum stairs.
   b. Damp wipe railings.
8. Carpet Care:
   a. Vacuum carpet throughout the Store.
   b. Spot clean carpets (looking for visible spots).
9. VCT Tile - Clean and Seal: Provide the following floor care service as soon as practical following floor installation. Anticipate within 3-5 days after floor installation.
   a. Complete gum, embedded materials and scuff mark removal. Best efforts utilized to clean tire marks and gouges.
   b. Sweep and damp mop all exposed tile areas.
   c. Effectively protect all adjoining floors (carpet, wood, etc.) from solution run-off /splash spillage.
   d. Before Construction turnover:
      1) Complete strip of all exposed tile using a national brand stripper product.
      2) Complete rinse, if required, of all exposed tile areas.
      3) Professional application of one (1) coat of a national brand floor sealer.
      4) Professional application of three (3) coats of Buckeye “Castleguard” to all aisles and (5) for all other VCT areas.
   e. Pre-Soft Opening:
      1) Sunday night, deep scrub the aisles and apply (2) coats of floor finish.
      2) High speed buff the Wednesday morning of Soft Opening.
10. Vinyl Wood Plank Flooring - Clean, Seal and Finish: Provide the following floor care service as soon as practical following floor installation. Anticipate within 3-5 days after floor installation.
    a. Complete gum, embedded materials and scuff mark removal. Best efforts utilized to clean tire marks.
    b. Sweep all exposed vinyl plank floor areas.
    c. Effectively protect all adjoining floors (carpet, wood, etc.) from solution run-off /splash spillage.
    d. Before Construction turnover:
       1) Complete strip of all vinyl wood floor areas using a national brand neutral brand stripper.
       2) Complete rinse of all exposed vinyl wood floor areas.

3) Professional application of one (1) coat of a national brand floor sealer. See product above.
4) Professional application of three (5) coats of Buckeye “Castleguard”.

e. Pre-Soft Opening:
1) Sunday night, deep scrub the aisles and apply (2) coats of floor finish.
2) High speed buff the Wednesday morning of Soft Opening.

11. Special Notes:
a. Low speed ONLY Scrub / Strip. Use one pad on vinyl wood floors. High speed burnishing can ‘burn’ high spots and/or remove surface texture.
b. Never allow standing water on vinyl wood floors as this may cause floor to lift.
c. General Contractor and DSG Store Manager to protect floor with plywood (heavy traffic), Masonite (medium traffic), and cardboard (foot traffic only).
d. General Contractor’s Ceramic Tile Floor Installer should seal ceramic tile grout per manufacturer’s specifications.
e. Spray and burnish service available, if required. Quoted service.

12. Ceramic Tile Cleaning:
a. Machine scrub all ceramic tile and slat floors throughout the Store, including restrooms.
b. Clean ceramic tile and grout.

13. Window Cleaning:
a. Clean all interior and exterior windows including vestibules and entrance doors.
b. Wash outside glass as well as lower horizontal architectural trim to remove dirt, smudges, fingerprints and streaks.
c. Wash inside glass and window ledge as well as extension. Dust adjacent to architectural trim to remove all dirt, smudges, fingerprints, streaks, cobwebs, etc.
d. Wash vestibule windowpanes inside and outside, including all trim.
e. Wash all merchandise display windows inside and outside, including all trim.
f. Special Note: Removal of adhered materials, stickers, tape, Styrofoam, cement splatter, debris, etc., will require a quoted additional charge. Additional fees are charged for 3 floor clerestory windows if applicable.

L. Follow-up and Reporting
1. Completed General Contractor Check List is to be signed off by Cleaning Contractor and General Contractor.
a. Conditions should be photographed with a digital camera so that the images files size are 2 megabits or large. Photos should be shot of the following areas after cleaning:
1) Power Aisle
2) Flooring in the Lodge
3) VCT at the Checkout area
b. E-mail copies of the photos to the DSG Construction Project Manager and DSG New Store Manager and with-in one (1) day of completing the work.
2. Any disputes or un-acceptable results will be resolved by the DSG Construction Manager.

**3.12 CLOSEOUT PROCEDURES**

A. Make submittals that are required by governing or other authorities.

B. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's Notice of Substantial Completion.

C. Notify Architect when work is considered ready for Architect's Substantial Completion inspection.

D. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's Substantial Completion inspection.

E. Conduct Substantial Completion inspection and create Final Correction Punch List containing Architect's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Architect.

F. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.

G. Notify Architect when work is considered finally complete and ready for Architect's Substantial Completion final inspection.

H. Complete items of work determined by Architect listed in executed Certificate of Substantial Completion.

**3.13 MAINTENANCE**

A. Provide service and maintenance of components indicated in specification sections.

B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Substantial Completion or the length of the specified warranty, whichever is longer.

C. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.

D. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.

E. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

**3.14 GUARANTEES AND WARRANTIES**

A. General Warranties:

1. Contractor's general warranty: The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless otherwise required or permitted by the Contract Documents, that the work will be free from defects not inherent in the quality required or permitted, and that the Work will conform with the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, modifications not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear under normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.
2. Manufacturer's guarantees and warranties: Guarantees and warranties provided by manufacturers are in addition to, not in lieu of, the Contractor's general warranty.
3. Proprietary specifications and construction procedures: The Contractor shall guarantee the performance of products, construction methods and installation procedures, covered by proprietary specifications under his "GENERAL WARRANTY" and in accord with the requirements of this section.
4. Particular requirements:
    a. The Contractor does hereby warrant and covenant to the Owner that all materials and workmanship shall be of the highest quality, in accordance with the Contract Documents and free from defects that if any portion of the Work is not of the highest quality, in accordance with the Contract Documents and also free from defects. The Contractor shall, upon the request of the Owner, for a period of one year from the date of the Date of the Certificate of Substantial Completion, promptly correct such non-compliant work, materials or defect. For the purposes of ascertaining the quality and performance standards required by this warranty and for ascertaining the Contractor’s responsibility in cases where the required performance standard has not been met, the Owner and the Contractor shall agree that they will be guided by the performance standard for workmanship, materials, systems, and structures deemed

appropriate by the Architect, except for the following standards which shall be set forth:

1) Should there be any conflict between the local and state building codes, the quality of standard for sound industry practices with regard to materials or workmanship, and the quality standard required by the Contract Documents, the stricter standard shall govern.
2) See additional warranty requirements within Specifications.

B. Date of Commencement of the Contractor's General Warranty shall be the date of the "CERTIFICATE OF SUBSTANTIAL COMPLETION".

C. Should "CERTIFICATE OF SUBSTANTIAL COMPLETION" not be issued, the date of commencement of all Guarantees and Warranties shall be the date the Architect certifies the "FINAL PAY REQUEST".

D. The Contractor shall provide a written Guaranty/Warranty, properly executed by appropriate Subcontractor or Material Supplier, or both, countersigned and guaranteed by the Contractor, that their Work will be free from defects of materials and workmanship, and shall remain in proper operating condition for a period of 1 year.

E. The Contractor shall submit all Guarantees and Warranties to the Owner for approval prior to Certification of the Contractor's Final Application for Payment.

F. A. Work performed under this Guarantee/Warranty shall be Guaranteed/Warranted for a period of 1 year from the date such Work is completed.

**END OF SECTION**

**SECTION 02 4100**

**DEMOLITION**

***** DESIGNER NOTE: ARCHITECT OF RECORD (AOR) TO MODIFY/AMMEND THIS SECTION TO MEET SITE SPECIFIC CONDITIONS OF PROJECT.***

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Building demolition excluding removal of hazardous materials and toxic substances.

B. Abandonment and removal of existing utilities and utility structures.

### 1.02 REFERENCE STANDARDS

A. 29 CFR 1926 - U.S. Occupational Safety and Health Standards; current edition.

B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2013.

C. ANSI A10.6 - Safety Requirements for Demolition Operations; Current Edition.

D. IBC Chapter 33, Safeguards During Construction.

### 1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

### 1.04 QUALITY ASSURANCE

A. Demolition Firm Qualifications: Company specializing in the type of work required.

B. Comply with governing EPA notification regulations.

## PART 2 PRODUCTS

### 2.01 MATERIALS

A. Fill Material: As specified in Section 31 2323 - Fill.

## PART 3 EXECUTION

### 3.01 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with other requirements specified in Section 01 7000.

B. Perform an engineering survey of building to determine whether demolition operations might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures.

C. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.

1. Obtain required permits.
2. Comply with applicable requirements of NFPA 241, ANSI A10.6 and the Building Code.
3. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
4. Provide, erect, and maintain temporary barriers and security devices.
5. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
6. Do not close or obstruct roadways or sidewalks without permit.
7. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.

8. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.

D. Do not begin removal until receipt of notification to proceed from Owner.

E. Do not begin removal until built elements to be salvaged or relocated have been removed.

F. Do not begin removal until vegetation to be relocated has been removed and specified measures have been taken to protect vegetation to remain.

G. Protect existing structures and other elements that are not to be removed.
   1. Provide bracing and shoring.
   2. Prevent movement or settlement of adjacent structures.
   3. Stop work immediately if adjacent structures appear to be in danger.

H. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

I. If hazardous materials are discovered during removal operations, stop work and notify Owner; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.

J. Perform demolition in a manner that maximizes salvage and recycling of materials; where applicable, comply with state and local AHJ requirements.
   1. Dismantle existing construction and separate materials.
   2. At no additional cost to DSG, set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse. Unless noted otherwise, contractor shall bear the cost and/or recoup the credit for materials that have been salvaged and recycled.

K. Grading: Grade demolition areas to level condition, sloped to drain, with smooth transitions to adjacent surfaces.

**3.02 EXISTING UTILITIES**

A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.

B. Protect existing utilities to remain from damage.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.

E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 7 days prior notification to Owner.

F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

H. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone; identify and mark utilities to be subsequently reconnected, in same manner as other utilities to remain.

I. Refer to mechanical and electrical specifications for additional demolition requirements for plumbing, mechanical and electrical items.

**3.03 DEBRIS AND WASTE REMOVAL**

A. Remove debris, junk, and trash from site.

B. Leave site in clean condition, ready for subsequent work.

C. Clean up spillage and wind-blown debris from public and private lands.

**END OF SECTION**

## SECTION 03 2000
## CONCRETE REINFORCING

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Reinforcing steel for cast-in-place concrete.

B. Supports and accessories for steel reinforcement.

### 1.02 REFERENCE STANDARDS

A. ACI 301 - Specifications for Structural Concrete; 2010 (Errata 2012).

B. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; 2014 (Errata 2016).

C. ACI SP-66 - ACI Detailing Manual; 2004.

D. ASTM A184/A184M - Standard Specification for Welded Deformed Steel Bar Mats for Concrete Reinforcement; 2006 (Reapproved 2011).

E. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2016.

F. ASTM A704/A704M - Standard Specification for Welded Steel Plain Bar or Rod Mats for Concrete Reinforcement; 2006 (Reapproved 2011).

G. ASTM A706/A706M - Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement; 2014.

H. ASTM A996/A996M - Standard Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement; 2014.

I. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2015.

J. AWS D1.4/D1.4M - Structural Welding Code - Reinforcing Steel; 2011.

K. CRSI (DA4) - Manual of Standard Practice; 2009.

L. CRSI (P1) - Placing Reinforcing Bars; 2011.

### 1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Include bar schedules, shapes of bent bars, spacing of bars, and location of splices.
   1. Prepare shop drawings under seal of a Professional Structural Engineer experienced in design of work of this type and licensed in the State in which the Project is located.

C. Manufacturer's Certificate: Certify that reinforcing steel and accessories supplied for this project meet or exceed specified requirements.

D. Reports: Submit certified copies of mill test report of reinforcement materials analysis.

### 1.04 QUALITY ASSURANCE

A. Perform work of this section in accordance with ACI 301.
   1. Maintain one copy of each document on project site.

B. Welders' Certificates: Submit certifications for welders employed on the project, verifying AWS qualification within the previous 12 months.

### PART 2 PRODUCTS

### 2.01 REINFORCEMENT

A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi).
   1. Deformed billet-steel bars.
   2. Unfinished.

B. Reinforcing Steel: ASTM A706/A706M, deformed low-alloy steel bars.
   1. Unfinished.

C. Reinforcing Steel: Deformed bars, ASTM A996/A996M Grade 60 (420), Type A or R.

D. Stirrup Steel: ASTM A1064/A1064M steel wire, unfinished.

E. Steel Welded Wire Reinforcement (WWR): Plain type; ASTM A1064/A1064M.
   1. Form: Flat Sheets.
   2. WWR Style: As indicated on drawings.

F. Reinforcement Accessories:
   1. Tie Wire: Annealed, minimum 16 gage, 0.0508 inch.
   2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.
      a. Only products strictly intended for support of concrete reinforcement shall be used. Use of foriegn materials, such as bricks, concrete blocks, rocks, wood, or other miscellanous items, is not permitted.
   3. Provide galvanized or plastic components for placement within 1-1/2 inches of weathering surfaces.

**2.02 FABRICATION**

A. Fabricate concrete reinforcing in accordance with CRSI (DA4) - Manual of Standard Practice and ACI SP-66 - ACI Detailing Manual.

B. Welding of reinforcement is not permitted.

C. Locate reinforcing splices as indicated on drawings, if applicable.

**PART 3 EXECUTION**

**3.01 PLACEMENT**

A. General: Reinforcement shall conform to ACI 3001, and shall comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
   1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
   1. Weld reinforcing bars according to AWS D1.4, where indicated.

D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continious laps in either direction. Lace overlaps with wire.

**3.02 FIELD QUALITY CONTROL**

A. An independent testing agency, as specified in Section 01 4000, will inspect installed reinforcement for conformance to contract documents before concrete placement.

B. Testing and Inspecting: Owner will engage a special inspector, and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

C. Concrete testing shall be in accordance with ACI 301, Section 1, Article 1.6 except as noted herein.

D. Required special inspection and verification as outlined in IBC Table 1704.4.
   1. Steel reinforcement and placement.
   2. Steel reinforcement welding.

3. Embeded bolts and studs to be installed in concrete prior to concrete placement.
4. Verification of use of required design mixture.
5. At the time concrete is sampled for test cylinders, perform slump and air content tests and temperature of concrete.
6. Concrete placement, including conveying and depositing.
7. Curing procedures and maintenance of curing temperature.
8. Verification of concrete strength before removal of shores and forms from beams and slabs.
9. Verification of concrete strength prior to stressing of post-tensioned tendons.

**END OF SECTION**

**SECTION 03 3000**

**CAST-IN-PLACE CONCRETE**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Concrete formwork.

B. Elevated concrete slabs on metal deck.

C. Slabs on grade.

D. Miscellaneous concrete elements, including equipment pads.

E. Concrete curing.

F. Footings.

### 1.02 REFERENCE STANDARDS

A. ACI 117 - Standard Specifications for Tolerances for Concrete Construction and Materials; 2010.

B. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; 1991 (Reapproved 2009).

C. ACI 301 - Specifications for Structural Concrete; 2010 (Errata 2012).

D. ACI 302.1R - Guide for Concrete Floor and Slab Construction; 2004 (Errata 2007).

E. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; 2000.

F. ACI 305R - Hot Weather Concreting; 2010.

G. ACI 306R - Cold Weather Concreting; 2010.

H. ACI 308R - Guide to Curing Concrete; 2001 (Reapproved 2008).

I. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; 2014 (Errata 2016).

J. ACI 347R - Guide to Formwork for Concrete; 2014.

K. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2016.

L. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2015a.

M. ASTM C150/C150M - Standard Specification for Portland Cement; 2016.

N. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete; 2007.

O. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2010a.

P. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2011.

Q. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2013.

R. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2015.

S. ASTM C1059/C1059M - Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete; 2013.

T. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2014.

U. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures; 2014.

V. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types); 2004 (Reapproved 2013).

W. ASTM D2103 - Standard Specification for Polyethylene Film and Sheeting; 2015.

X. ASTM E1155 - Standard Test Method for Determining F(F) Floor Flatness and F(L) Floor Levelness Numbers; 1996 (Reapproved 2008).

Y. ASTM E1643 - Standard Practice for Selection, Design, Installation and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs; 2011.

Z. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2011.

AA. COE CRD-C 513 - COE Specifications for Rubber Waterstops; 1974.

**1.03 SUBMITTALS**

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.
   1. For curing compounds, provide data on method of removal in the event of incompatibility with floor covering adhesives.

C. Mix Design: Submit proposed concrete mix design.
   1. Indicate proposed mix design complies with requirements of ACI 301, Section 4 - Concrete Mixtures.
   2. Indicate proposed mix design complies with requirements of ACI 318, Chapter 5 - Concrete Quality, Mixing and Placing.

D. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Included bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement. Detailing shall conform to ACI 315-99 Details and Detailing of Concrete Reinforcement.

E. Formwork Shop Drawings: Prepared by or under the supervision of a qualified professional engineer detailing fabrication, assembly, and support of formwork.

F. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
   1. Location of construction joints is subject to approval of the Architect.

G. Material Certificates: For each of the following, signed by manufacturers:
   1. Cementitious materials.
   2. Admixtures.
   3. Steel reinforcement and accessories.
   4. Waterstops.
   5. Curing compounds.
   6. Bonding agents.
   7. Vapor retarders.

H. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:
   1. Aggregates.

I. Floor surface flatness and levelness measurements indicating compliance with specified tolerances.

J. Field quality-controled reports.

**1.04 QUALITY ASSURANCE**

A. Perform work of this section in accordance with ACI 301 and ACI 318.
   1. Maintain one copy of each document on site.

B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.

C. Follow recommendations of ACI 305R when concreting during hot weather.

D. Follow recommendations of ACI 306R when concreting during cold weather.

E. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.

## PART 2 PRODUCTS

### 2.01 FORMWORK

A. Formwork Design and Construction: Comply with guidelines of ACI 347R to provide formwork that will produce concrete complying with tolerances of ACI 117.

B. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.
   1. Form Facing for Exposed Finish Concrete: Contractor's choice of materials that will provide smooth, stain-free final appearance.
   2. Form Coating: Release agent that will not adversely affect concrete or interfere with application of coatings.
   3. Form Ties: Cone snap type that will leave no metal within 1-1/2 inches of concrete surface.

### 2.02 REINFORCEMENT

A. Comply with requirements of Section 03 2000.

### 2.03 CONCRETE MATERIALS

A. Cement: ASTM C150/C150M, Type I - Normal; Type IA - Air Entraining; Type III - High Early Strength; Type IIIA - Air Entraining Portland type.
   1. Acquire all cement for entire project from same source.

B. Fine and Coarse Aggregates: ASTM C 33.
   1. Acquire all aggregates for entire project from same source.

C. Fly Ash: ASTM C618, Class C or F.

D. Water: ASTM C94 and potable.

### 2.04 ADMIXTURES

A. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.

B. Air Entrainment Admixture: ASTM C260/C260M.

C. High Range Water Reducing and Retarding Admixture: ASTM C494/C494M Type G.

D. High Range Water Reducing Admixture: ASTM C494/C494M Type F.

E. Water Reducing and Retarding Admixture: ASTM C494/C494M Type D.

F. Retarding Admixture: ASTM C494/C494M Type B.

G. Water Reducing Admixture: ASTM C494/C494M Type A.

### 2.05 ACCESSORY MATERIALS

A. Underslab Vapor Retarder: Multi-layer, fabric-, cord-, grid-, or aluminum-reinforced polyethylene or equivalent, complying with ASTM E1745, Class C; stated by manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs. The use of single ply polyethylene is prohibited.
   1. Installation: Comply with ASTM E1643.
   2. Thickness: 10 mils minimum.
   3. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations in vapor retarder.

B. Non-Shrink Cementitious Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
   1. ASTM C1107/C1107M; Grade A, B, or C.

2. Minimum Compressive Strength at 48 Hours: 2,000 pounds per square inch.
3. Minimum Compressive Strength at 28 Days: 7,000 pounds per square inch.

**2.06 JOINTING PRODUCTS**

A. Bonding Agent: ASTM C1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

B. Waterstops: Rubber, complying with COE CRD-C 513.
1. Configuration: As indicated on the drawings.
2. Size: As indicated on the drawings.

C. Slab Isolation Joint Filler: 1/2 inch thick, height equal to slab thickness, with removable top section that will form 1/2 inch deep sealant pocket after removal.
1. Material: ASTM D1751, cellulose fiber.

**2.07 CURING MATERIALS**

A. General: As per ACI 301, Section 5, Article 5.2, with sections and supplements as specified herein.

B. Moisture-Retaining Cover: ASTM C171, polyethylene film or white burlap-polyethylene sheet.

C. Water: Potable.

D. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C309, Type 1 D, Class B, dissipating (sodium silicate type not permitted) having a figitive dye to facilitate visual check of coverage.

**2.08 CONCRETE MIX DESIGN**

A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.

B. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI 301.
1. For trial mixtures method, employ independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.

C. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended or required by manufacturer.

D. Normal Weight Concrete:
1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: As indicated on drawings.
2. Fly Ash Content: Maximum 20 percent of cementitious materials by weight.
3. Cement Content: As indicated on drawings.
4. Total Air Content: Determined in accordance with ASTM C173/C173M; as indicated on drawings.
5. Maximum Slump: As indicated on drawings.
6. Maximum Aggregate Size: As indicated on drawings.

**2.09 MIXING**

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C94 and furnish batch ticket information.
1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

A. Verify lines, levels, and dimensions before proceeding with work of this section.

**3.02 PREPARATION**

A. Formwork: Comply with requirements of ACI 301. Design and fabricate forms to support all applied loads until concrete is cured, and for easy removal without damage to concrete.

B. Verify that forms are clean and free of rust before applying release agent.

C. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.

D. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.
   1. Use latex bonding agent only for non-load-bearing applications.

E. Dowel new concrete to existing concrete as indicated on drawings.

F. Interior Slabs on Grade: Install vapor retarder under interior slabs on grade. Lap joints minimum 6 inches. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions. Repair damaged vapor retarder before covering.
   1. Use as indicated on drawings:
      a. Granular Fill Over Vapor Retarder: Cover vapor retarder with compactible granular fill as shown on the drawings. Do not use sand.
      b. Vapor Retarder Over Granular Fill: Install compactible granular fill before placing vapor retarder as shown on the drawings. Do not use sand.

**3.03 PLACING CONCRETE**

A. Place concrete in accordance with ACI 304R.

B. Place concrete for floor slabs in accordance with ACI 302.1R.

C. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.

D. Ensure reinforcement, inserts, waterstops, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.

E. Place concrete continuously without construction (cold) joints wherever possible; where construction joints are necessary, before next placement prepare joint surface by removing laitance and exposing the sand and sound surface mortar, by sandblasting or high-pressure water jetting.

F. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.

**3.04 SLAB JOINTING**

A. Locate joints as indicated on the drawings.

B. Anchor joint fillers and devices to prevent movement during concrete placement.

C. Isolation Joints: Use preformed joint filler with removable top section for joint sealant, total height equal to thickness of slab, set flush with top of slab.
   1. Install wherever necessary to separate slab from other building members, including columns, walls, equipment foundations, footings, stairs, manholes, sumps, and drains.

D. Load Transfer Construction and Contraction Joints: Install load transfer devices as indicated; saw cut joint at surface as indicated for contraction joints.

E. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth as shown in the drawings details.
   1. Sawed Joints: Form control joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks (0-2 hours after the final finish at each joint location) using the early-entry dry-out process per ACI 302.1R. The saw shall employ the use of a skid plate to prevent spalling and raveling of the slab.

## 3.05 FLOOR FLATNESS AND LEVELNESS TOLERANCES

A. An independent testing agency, as specified in Section 01 4000, will inspect finished slabs for conformance to specified tolerances.

B. Minimum F(F) Floor Flatness and F(L) Floor Levelness Values:
   1. Exposed to View and Foot Traffic: F(F) of 20; F(L) of 15, on-grade only.
   2. Under Thick-Bed Tile: F(F) of 20; F(L) of 15, on-grade only.
   3. Under Carpeting: F(F) of 25; F(L) of 20, on-grade only.
   4. Under Thin Resilient Flooring and Thinset Tile: F(F) of 35; F(L) of 25, on-grade only.

C. Measure F(F) and F(L) in accordance with ASTM E1155, within 48 hours after slab installation; report both composite overall values and local values for each measured section.

D. Correct the slab surface if composite overall value is less than specified and if local value is less than two-thirds of specified value or less than F(F) 13/F(L) 10.

E. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

## 3.06 CONCRETE FINISHING

A. Repair surface defects, including tie holes, immediately after removing formwork.

B. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch or more in height.

C. Exposed Form Finish: Rub down or chip off and smooth fins or other raised areas 1/4 inch or more in height. Provide finish as follows:
   1. Grout Cleaned Finish: Wet areas to be cleaned and apply grout mixture by brush or spray; scrub immediately to remove excess grout. After drying, rub vigorously with clean burlap, and keep moist for 36 hours.

D. Concrete Slabs: Finish to requirements of ACI 302.1R, and as follows:
   1. Surfaces to Receive Thin Floor Coverings: "Steel trowel" as described in ACI 302.1R; thin floor coverings include carpeting, resilient flooring, seamless flooring, resinous matrix terrazzo, thin set quarry tile, and thin set ceramic tile.
   2. Other Surfaces to Be Left Exposed: Trowel as described in ACI 302.1R, minimizing burnish marks and other appearance defects.

E. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at 1:100 nominal.

## 3.07 CURING AND PROTECTION

A. Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
   1. Normal concrete: Not less than 7 days.
   2. High early strength concrete: Not less than 4 days.

C. Formed Surfaces: Cure by moist curing with forms in place for full curing period.

D. Surfaces Not in Contact with Forms, use one or a combination of the following methods:
   1. Slabs and Floors To Receive Adhesive-Applied Flooring: Curing compounds and other surface coatings are usually considered unacceptable by flooring and adhesive manufacturers. If such materials must be used, either obtain the approval of the flooring and adhesive manufacturers prior to use or remove the surface coating after curing to flooring manufacturer's satisfaction.
   2. Curing Compound: Apply in two coats at right angles, using application rate recommended by manufacturer.

## 3.08 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000 - Quality Requirements.

B. Provide free access to concrete operations at project site and cooperate with appointed firm.

C. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.

D. Testing and Inspecting: Owner will engage a special inspector, and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

E. Concrete testing shall be in accordance with ACI 301, Section 1, Article 1.6 except as noted herein.

F. Requested special inspection and verification as outlines in IBC Table 1704.4.
   1. Steel reinforcement and placement.
   2. Steel reinforcement welding.
   3. Embedded bolts and studs to be installed in concrete prior to concrete placement.
   4. Verification of use of required design mixture.
   5. At the time concrete is sampled for test cylinders, perform slump and air content tests and temperature of concrete.
   6. Concrete placement, including conveying and depositing.
   7. Curing procedures and maintenance of curing temperature.
   8. Verification of concrete strength before removal of shores and forms from beams and slabs.
   9. Verification of concrete strength prior to stressing of post-tensioned tendons.

G. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C172 shall be performed according to the following requirements:
   1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 10 cu. yd., unless authorized otherwise by the engineer.
      a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer then five are used.
   2. All samples that be taken after any addition of water at the job site is complete. When pumping or pneumatic equipment is used, samples shall be taken at discharge end. This is for both cylinders and slump tests.
   3. Slump: ASTM C143; one test at point of pacement for each composite sample, but note less than one test for each day's pour of each concrete misture. Perform additional tests when concrete consistency appears to change.
   4. Air Content: ASTM C231, pressure method, for normal-weight concrete; [ASTM C173, volumetric method, for structural lightweight concrete;] one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
      a. Air content tests shall be made on all concrete whether the concrete is designated as air-entrained or not.
      b. Additional air contents tests, for concrete specified as air-entrained, shall be made when any of the following conditions occur:
         1) A change in appearance or consistency of concrete.
         2) Possible reduction of air content due to time delays of truck and/or hot weather.
         3) When air temperature is over 80 deg F, check each truck load.
      c. Inform engineer immediately of any slump and/or air content tests that do not meet these specifications. If strength, durability or aesthetics of the structure would be impaired, that concrete shall not be used.
   5. Concrete Temperature: ASTM C1064; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.
   6. Compression Test Specimens: ASTM C31.

a. Cast and laboratory cure four standard cylinder specimens for each composite sample.

7. Compressive-Strength Tests: ASTM C39; test one laboratory-cured specimen at 7 days (2 days for post tensioned concrete) and one set of two specimens at 28 days. Retain one cylinder for possible 56 day test if required.
   a. The 28 day compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same conposite sample and tested at age indicated.
8. When strength of field-cured cylinders is than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
9. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more then 500 psi.
10. Test results shall be reported in writing to the Structural Engineer, Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive strength tests shall contain Project indentification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
11. Verbal information on any concrete not meeting these specifications shall be communicated to the engineer immediately by phone.
12. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
13. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42 by other methods as directed by Architect.
14. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
15. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

H. Measure floor and slab flatness and levelness according to ASTM E1155 within 48 hours of finishing.

**3.09 DEFECTIVE CONCRETE**

A. Test Results: The testing agency shall report test results in writing to Architect and Contractor within 48 hours of test.

B. Defective Concrete: Repair or replace concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.

**3.10 PROTECTION**

A. Do not permit traffic over unprotected concrete floor surface until fully cured.

**3.11 SCHEDULE - CONCRETE TYPES AND FINISHES**

A. Equipment Housekeeping Pads: Install concrete not more than (7) days prior to scheduled installation of equipment.

**END OF SECTION**

## SECTION 03 3511
## CONCRETE FLOOR FINISHES

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

A. Surface treatments for concrete floors and slabs.

#### 1.02 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the work with concrete floor placement and concrete floor curing.

#### 1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's published data on each finishing product, including information on compatibility of different products and limitations.

#### 1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's sealed packaging, including application instructions.

#### 1.05 FIELD CONDITIONS

A. Maintain ambient temperature of 50 degrees F minimum.

### PART 2 PRODUCTS

#### 2.01 CONCRETE FLOOR FINISH APPLICATIONS

A. Unless otherwise indicated, all concrete floors are to be finished using liquid densifier/hardener.

B. Liquid Densifier/Hardener:
   1. Use at following locations: Exposed concrete that will not recieve an additional finish material.

#### 2.02 DENSIFIERS AND HARDENERS

A. Liquid Densifier/Hardener: Clear, penetrating, water based chemical compound that reacts with concrete, filling the pores and dustproofing; for application to concrete after set.
   1. Composition: Sodium silicate.
   2. Products:
      a. Nox-Crete Products Group; Duro-Nox: www.nox-crete.com.

### PART 3 EXECUTION

#### 3.01 EXAMINATION

A. Verify that floor surfaces are acceptable to receive the work of this section.

B. Verify that flaws in concrete have been patched and joints filled with methods and materials suitable for further finishes.

#### 3.02 GENERAL

A. Apply materials in accordance with manufacturer's instructions.

#### 3.03 COATING APPLICATION

A. Verify that surface is free of previous coatings, sealers, curing compounds, water repellents, laitance, efflorescence, fats, oils, grease, wax, soluble salts, residues from cleaning agents, and other impediments to adhesion.

B. Verify that water vapor emission from concrete and relative humidity in concrete are within limits established by coating manufacturer.

C. Protect adjacent non-coated areas from drips, overflow, and overspray; immediately remove excess material.

D. Apply coatings in accordance with manufacturer's instructions.

**END OF SECTION**

## SECTION 03 5400
## SELF-LEVELING UNDERLAYMENT

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

A. Liquid-applied self-leveling floor underlayment.
   1. Use cementitious type at locations indicated on drawings.

#### 1.02 REFERENCE STANDARDS

A. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or (50-mm) Cube Specimens); 2013.

B. ASTM C348 - Standard Test Method for Flexural Strength of Hydraulic-Cement Mortars; 2014.

#### 1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's data sheets documenting physical characteristics and product limitations of underlayment materials. Include information on surface preparation and environmental limitations.

#### 1.04 QUALITY ASSURANCE

A. Applicator Qualifications: Company specializing in performing the work of this section, and approved by manufacturer.

#### 1.05 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Keep dry and protect from direct sun exposure, freezing, and ambient temperature greater than 105 degrees F.

#### 1.06 FIELD CONDITIONS

A. Do not install underlayment until floor penetrations and peripheral work are complete.

B. During the curing process, ventilate spaces to remove excess moisture.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

A. Confirm acceptable manufacturers and products with Vendor #03 prior to use.

B. Cementitious Underlayment:
   1. ARDEX Engineered Cements: www.ardexamericas.com.
      a. Ardex K15
      b. Ardex P-51 Primer
      c. Ardex P-82 Ultra Prime
      d. Ardex E-25 Resilient Emulsion
      e. Ardex SD-P Instant Patch
   2. MAPEI Corporation: www.mapei.com
      a. Mapei Ultra Plain Easy
      b. Mapei Primer T
      c. Mapei Primer WE
      d. Mapei Planiprep FF (Patching Compound)

#### 2.02 MATERIALS

A. Cementitious Underlayment: Blended cement mix, that when mixed with water in accordance with manufacturer's directions will produce self-leveling underlayment with the following properties:
   1. Compressive Strength: Minimum 4000 psi after 28 days, tested per ASTM C109/C109M.
   2. Flexural Strength: Minimum 1000 psi after 28 days, tested per ASTM C348.
   3. Density: 125 lb/cu ft, nominal.

B. Water: Potable and not detrimental to underlayment mix materials.

C. Primer: Manufacturer's recommended type.

D. Joint and Crack Filler: Latex based filler, as recommended by manufacturer.

**2.03 MIXING**

A. Site mix materials in accordance with manufacturer's instructions.

B. Mix to self-leveling consistency without over-watering.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

A. Verify that substrate surfaces are clean, dry, unfrozen, do not contain petroleum byproducts, or other compounds detrimental to underlayment material bond to substrate.

**3.02 PREPARATION**

A. Concrete: Mechanically prepare steel troweled concrete to create a textured surface necessary to achieve the best bond; acceptable methods include bead blasting and scarifying. Do not use acid etching.

B. Remove substrate surface irregularities. Fill voids and deck joints with filler. Finish smooth.

C. Vacuum clean surfaces.

D. Prime substrate in accordance with manufacturer's instructions. Allow to dry.

E. Close floor openings.

**3.03 APPLICATION**

A. Install underlayment in accordance with manufacturer's instructions.

B. Place to indicated thickness, with top surface level to 1/8 inch in 10 ft.

C. Place before partition installation.

**3.04 CURING**

A. Once underlayment starts to set, prohibit foot traffic until final set has been reached.

B. Air cure in accordance with manufacturer's instructions.

**3.05 PROTECTION**

A. Protect against direct sunlight, heat, and wind; prevent rapid drying to avoid shrinkage and cracking.

B. Do not permit traffic over unprotected floor underlayment surfaces.

**END OF SECTION**

**SECTION 05 4000**

**COLD-FORMED METAL FRAMING**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Formed steel stud exterior wall and interior wall framing.

B. Formed steel slotted channel framing and bridging.

### 1.02 REFERENCE STANDARDS

A. AISI S100-12 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2012.

B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.

C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.

D. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015 (Errata 2016).

E. PS 1 - Structural Plywood; 2009.

F. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 1999 (Ed. 2004).

G. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); 2002 (Ed. 2004).

### 1.03 PERFORMANCE REQUIREMENTS

A. Structural Performance: The cold formed framing supplier shall design a complete system incorporating the minimum member sizes and the details indicated on the drawings. The complete system shall conform to the design intent indicated on the drawings. This system shall include all framing members shown on the structural drawings. Any deviation from this design shall be reviewed by the Architect and Engineer, and additional review costs shall be the responsibility of the Contractor. The supplier is responsible to provide and design all connections, bracing, bridging, stiffeners, etc. as required for a complete system and continuous load path as indicated on the structural drawings. The supplier's design shall not impose loading on the structure which differs from the designs intent indicated on the drawings. Provide cold-formed metal framing capable of withstanding design loads within limits and under conditions indicated.

1. Design Loads: As indicated on the drawings.
2. Deflection Limits: Design framing systems to withstand design loads without deflections greater than the following:
    a. Exterior Wall Framing: Horizontal deflection shall not exceed the following for the respective supported finishes:
        1) EIFS 1/240
        2) Brick Veneer 1/600
        3) Brick Veneer Wainscot Less Than 1/3 Story Height of Stud 1/360
        4) Tile 1/720
        5) Thin Brick 1/360
        6) Simulated Stone Veener 1/600
        7) Terra Cotta* 1/360
        8) Metal Panel* 1/240
        9) Interior Finished Drywall 1/360
        10) Stucco 1/360
            (a) Back span deflection shall not be reduced by high loads on parapets.
            (b) *Verify deflection criteria with finish system manufacturer's recommendations. Design with consideration for differential deflection between adjacent members as recommended by manufacturer.

b. Interior Non Load-Bearing Wall Framing: Horizontal deflection of 1/240 of the wall height under a horizontal load of 5 lbf/sq. ft..
c. Ceiling Joist Framing: Vertical deflection of 1/360 of the span for total load.

3. Design framing systems to provide for movement of framing members without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change of 120 deg F (67 deg C).
4. Design framing system to maintain clearances at openings, to allow for construction tolerances, and to accommodate live load deflection of primary building structure as follows:
   a. Upward and downward movement of 1inch .

B. Cold-Formed Steel Framing, General: Design according to AISI's "Standard for Cold-Formed Steel Framing - General Provisions."
1. Headers: Design according to AISI's "Standard for Cold-Formed Steel Framing - Header Design."
2. Design exterior non-load-bearing wall framing to accommodate horizontal deflection without regard for contribution of sheathing materials.
3. Roof Trusses: Design according to AISI's "Standard for Cold-Formed Steel Framing - Truss Design."

## 1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: For each type of cold-formed metal framing product and accessory indicated.

C. Shop Drawings: Show layout, spacings, sizes, thicknesses, and types of cold-formed metal framing; fabrication; and fastening and anchorage details, including mechanical fasteners. Show reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.
1. For cold-formed metal framing indicated to comply with design loads, include shop drawings and structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation, registered in the state where the project is located.

D. Welding certificates.

E. Product Test Reports: From a qualified testing agency, unless otherwise stated, indicating that each of the following complies with requirements, based on evaluation of comprehensive tests for current products:
1. Expansion anchors.
2. Power-actuated anchors.
3. Mechanical fasteners.
4. Vertical deflection clips.
5. Horizontal drift deflection clips
6. Miscellaneous structural clips and accessories.

## 1.05 QUALITY ASSURANCE

A. Designer Qualifications: Design framing system under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State in which the Project is located.

B. Engineering Responsibility: Preparation of Shop Drawings, design calculations, and other structural data by a qualified professional engineer.

C. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of cold-formed metal framing that are similar to those indicated for this Project in material, design, and extent.

D. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM E 329 to conduct the testing indicated.

E. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code--Steel," and AWS D1.3, "Structural Welding Code--Sheet Steel."

F. Fire-Test-Response Characteristics: Where indicated, provide cold-formed metal framing identical to that of assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.

G. F. AISI Specifications and Standards: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" and its "Standard for Cold-Formed Steel Framing - General Provisions."
   1. Comply with AISI's "Standard for Cold-Formed Steel Framing - Truss Design."
   2. Comply with AISI's "Standard for Cold-Formed Steel Framing - Header Design."

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. Metal Framing: Subject to compliance with specified requirement, the following are approved manufacturers:
   1. CEMCO; _____: www.cemcosteel.com.
   2. Clarkwestern Dietrich Building Systems LLC; ____: www.clarkdietrich.com.
   3. Marino; ____: www.marinoware.com.

B. Framing Connectors and Accessories: Subject to compliance with specified requirement, the following are approved manufacturers:
   1. Same manufacturer as metal framing.
   2. Simpson Strong Tie; ____: www.strongtie.com.

### 2.02 FRAMING SYSTEM

A. Provide primary and secondary framing members, bridging, bracing, plates, gussets, clips, fittings, reinforcement, and fastenings as required to provide a complete framing system.

B. Design Criteria: Provide completed framing system having the following characteristics:
   1. Design: Calculate structural characteristics of cold-formed steel framing members according to AISI S100-12.
   2. Structural Performance: Design, engineer, fabricate, and erect to withstand specified design loads for project conditions within required limits.
   3. Design Loads: In accordance with applicable codes.
   4. Live load deflection: See Preformance Requirements.
   5. Able to tolerate movement of components without damage, failure of joint seals, undue stress on fasteners, or other detrimental effects when subject to seasonal or cyclic day/night temperature ranges.
   6. Able to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.

C. Shop fabricate framing system to the greatest extent possible.

D. Deliver to site in largest practical sections.

### 2.03 FRAMING MATERIALS

A. Studs and Track: ASTM C955; studs formed to channel, "C", or "Sigma" shape with punched web; U-shaped track in matching nominal width and compatible height.
   1. Gage and Depth: As required to meet specified performance levels and as indicated on drawings.
   2. Galvanized in accordance with ASTM A653/A653M, G60/Z180 coating.

B. Joists: Fabricated from ASTM A653/A653M steel sheet, with G60/Z180 hot dipped galvanized coating.
   1. Base Metal: As required to meet specified performance levels within maximum depths indicated.

2. Gage and Depth: As required to meet specified performance levels or as indicated on drawings.

C. Framing Connectors: Factory-made, formed steel sheet.
   1. Material: ASTM A653/A653M SS Grade 33 and 40 (minimum), with G90/Z275 hot dipped galvanized coating for base metal thickness less than 10 gage, 0.1345 inch, and factory punched holes and slots.
   2. Structural Performance: Maintain load and movement capacity required by applicable code, when evaluated in accordance with AISI S100-12.
   3. Movement Connections: Provide mechanical anchorage devices that accommodate movement using slotted holes, shouldered screws or screws and anti-friction or stepped bushings, while maintaining structural performance of framing. Provide movement connections where indicated on drawings.
      a. Where continuous studs bypass elevated floor slab, connect stud to slab in manner allowing vertical movement of slab without affecting studs; allow for minimum movement of 1 inch.
      b. Where top of stud wall terminates below structural floor or roof, connect studs to structure in manner allowing vertical movement of slab without affecting studs; allow for minimum movement of 1 inch.
      c. Provide top track preassembled with connection devices spaced to fit stud spacing indicated on drawings; minimum track length of 12 feet.
      d. Provide top track with long leg track and head of wall movement connectors; minimum track length of 12 feet.
   4. Fixed Connections: Provide non-movement connections for tie-down to foundation, floor-to-floor tie-down, roof-to-wall tie-down, joist hangers, gusset plates, and stiffeners.
   5. Wall Stud Bridging Connections: Provide mechanical load-transferring devices that accommodate wind load torsion and weak axis buckling induced by axial compression loads. Provide bridging connections where indicated on the drawings.

## 2.04 ACCESSORIES

A. Bracing, Furring, Bridging: Formed sheet steel, thickness determined for conditions encountered; finish to match framing components.

B. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

C. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

## 2.05 FASTENERS

A. Self-Drilling, Self-Tapping Screws, Bolts, Nuts and Washers: Hot dip galvanized per ASTM A153/A153M.
   1. Products:
      a. ITW Commercial Construction North America; ITW CCNA-Buildex Teks Select Series; _____: www.ITWBuildex.com.

B. Anchorage Devices: Powder actuated, Drilled expansion bolts, and Screws with sleeves.

C. Welding: In conformance with 1.

# PART 3 EXECUTION

## 3.01 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.

B. Verify field measurements and adjust installation as required.

## 3.02 INSTALLATION, GENERAL

A. Install cold-formed metal framing according to AISI's "Standard for Cold-Formed Steel Framing - General Provisions" and to manufacturer's written instructions unless more stringent requirements are indicated.

B. Install cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened.
   1. Cut framing members by sawing or shearing; do not torch cut.
   2. Fasten cold-formed metal framing members by welding or screw fastening as indicated on the drawings. Wire tying of framing members is not permitted. Welding of studs at brick veneer back up is not permitted.
      a. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
      b. Locate mechanical fasteners and install according to Shop Drawings, and complying with requirements for spacing, edge distances, and screw penetration.

C. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.

D. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.

E. Do not bridge building expansion and control joints with cold-formed metal framing. Independently frame both sides of joints.

F. Install insulation, specified in Division 07 Section "Thermal Insulation," in built-up exterior framing members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.

G. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's standard punched openings.

H. Erection Tolerances: Install cold-formed metal framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:
   1. Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

### 3.03 INSTALLATION OF EXTERIOR NON-LOAD-BEARING WALL

A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure as indicated.

B. Fasten both flanges of studs to top and bottom track, unless otherwise indicated. Space studs as indicated.

C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.

### 3.04 INSTALLATION OF JOISTS

A. Install perimeter joist track sized to match joists. Align and securely anchor or fasten track to supporting structure at corners, ends, and spacings indicated on Shop Drawings.

B. Install joists bearing on supporting frame, level, straight, and plumb; adjust to final position, brace, and reinforce. Fasten joists to both flanges of joist track.
   1. Install joists over supporting frame with a minimum end bearing of 1-1/2 inches.
   2. Reinforce ends and bearing points of joists with web stiffeners, end clips, joist hangers, steel clip angles, or steel-stud sections as indicated on Shop Drawings.

C. Space joists not more than 2 inches from abutting walls, and as indicated on the drawings.

D. Frame openings with built-up joist headers consisting of joist and joist track, nesting joists, or another combination of connected joists if indicated.

E. Install joist reinforcement at interior supports with single, short length of joist section located directly over interior support, with lapped joists of equal length to joist reinforcement, or as indicated.
   1. Install web stiffeners to transfer axial loads of walls above.

F. Install bridging at intervals indicated. Fasten bridging at each joist intersection as follows:
   1. Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and joist-track solid blocking of width and thickness indicated. Fasten flat straps to bottom flange of joists and secure solid blocking to joist webs.

G. Secure joists to load-bearing interior walls to prevent lateral movement of bottom flange.

H. Install miscellaneous joist framing and connections, including web stiffeners, closure pieces, clip angles, continuous angles, hold-down angles, anchors, and fasteners, to provide a complete and stable joist-framing assembly.

**3.05 REPAIRS AND PROTECTION**

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed metal framing with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that cold-formed metal framing is without damage or deterioration at time of Substantial Completion.

**END OF SECTION**

**SECTION 05 5000**

**METAL FABRICATIONS**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Shop fabricated steel items.

### 1.02 REFERENCE STANDARDS

A. ANSI A14.3 - American National Standard for Ladders -- Fixed -- Safety Requirements; 2008.

B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.

C. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2012.

D. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2015.

E. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2014.

F. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions; 2015a.

G. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2012.

H. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015 (Errata 2016).

I. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 1999 (Ed. 2004).

J. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); 2002 (Ed. 2004).

K. SSPC-SP 2 - Hand Tool Cleaning; 1982 (Ed. 2004).

### 1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.

1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

## PART 2 PRODUCTS

### 2.01 MATERIALS - STEEL

A. Steel Sections: ASTM A36/A36M.

B. Steel Tubing: ASTM A501/A501M hot-formed structural tubing.

C. Pipe: ASTM A53/A53M, Grade B Schedule 40, black finish.

D. Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, plain.

E. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

F. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

### 2.02 FABRICATION

A. Fit and shop assemble items in largest practical sections, for delivery to site.

B. Fabricate items with joints tightly fitted and secured.

C. Continuously seal joined members by intermittent welds and plastic filler.

D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

**2.03 FABRICATED ITEMS**

A. Ladders: Steel; in compliance with ANSI A14.3; with mounting brackets and attachments; prime paint finish.
   1. Side Rails: 3/8 x 2 inches members spaced at 20 inches.
   2. Rungs: one inch diameter solid round bar spaced 12 inches on center.
   3. Space rungs 7 inches from wall surface.

B. Elevator Pit Ladders: Steel; in compliance with ASME A17.1; with mounting brackets and attachments; prime paint finish.

C. Corner Guards, Downspout Guards, and Loading Dock Edge Angles: As detailed; galvanized finish.

D. Bumper Posts and Guard Rails: As detailed; galvanized finish.

E. Bollards: Steel pipe, concrete filled, crowned cap, as detailed; galvanized finish.

F. Lintels: As detailed; prime paint finish.

G. Door Frames for Overhead Door Openings and Wall Openings: Channel sections; galvanized finish.

**2.04 FINISHES - STEEL**

A. Prepare surfaces to be primed in accordance with SSPC-SP2.

B. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

C. Prime Painting: One coat.

D. Galvanizing of Steel Members: Galvanize after fabrication to ASTM A123/A123M requirements.

**2.05 FABRICATION TOLERANCES**

A. Squareness: 1/8 inch maximum difference in diagonal measurements.

B. Maximum Offset Between Faces: 1/16 inch.

C. Maximum Misalignment of Adjacent Members: 1/16 inch.

D. Maximum Bow: 1/8 inch in 48 inches.

E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

A. Verify that field conditions are acceptable and are ready to receive work.

**3.02 PREPARATION**

A. Clean and strip primed steel items to bare metal where site welding is required.

B. Supply setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

**3.03 INSTALLATION**

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

C. Perform field welding in accordance with AWS D1.1/D1.1M.

D. Obtain approval prior to site cutting or making adjustments not scheduled.

E. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

**3.04 TOLERANCES**

A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch.

C. Maximum Out-of-Position: 1/4 inch.

**END OF SECTION**

# SECTION 06 1000
# ROUGH CARPENTRY

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Sheathing.

B. Roofing nailers.

C. Preservative treated wood materials.

D. Fire retardant treated wood materials.

E. Communications and electrical room mounting boards.

F. Concealed wood blocking, nailers, and supports.

### 1.02 REFERENCE STANDARDS

A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.

B. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2015a.

C. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2013.

D. ASTM D2898 - Standard Test Methods for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing; 2010.

E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.

F. AWPA U1 - Use Category System: User Specification for Treated Wood; 2012.

G. PS 2 - Performance Standard for Wood-Based Structural-Use Panels; 2010.

H. PS 20 - American Softwood Lumber Standard; 2010.

### 1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Manufacturer's Certificate: Certify that wood products supplied for rough carpentry meet or exceed specified requirements.

### 1.04 DELIVERY, STORAGE, AND HANDLING

A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, or installation.

## PART 2 PRODUCTS

### 2.01 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
   1. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.
   2. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

B. Lumber fabricated from old growth timber is not permitted.

C. All lumber shall be fire treated (unless otherwise noted).

## 2.02 DIMENSION LUMBER

A. Sizes: Nominal sizes as indicated on drawings, S4S.

B. Moisture Content: S-dry or MC19.

C. Miscellaneous Blocking, Nailers, and Furring:
   1. Lumber: S4S, No. 2 or Standard Grade.
   2. Boards: Standard or No. 3.

## 2.03 CONSTRUCTION PANELS

A. Roof Sheathing: Any PS 2 type, rated Structural I Sheathing.
   1. Bond Classification: Exterior.
   2. Span Rating: 60.
   3. Performance Category: 3/4 PERF CAT.

B. Wall Sheathing: Any PS 2 type.
   1. Bond Classification: Exterior.
   2. Grade: Structural I Sheathing.
   3. Span Rating: 24.
   4. Performance Category: 5/8 PERF CAT.

C. Wall Sheathing: Glass mat faced gypsum, ASTM C1177/C1177M, square long edges, 5/8 inch.
   1. At Assemblies Indicated with Fire-Rating: Use type required by indicated tested assembly.

D. Insulated Wall Sheathing: Extruded polystyrene foam plastic, ASTM C 578, Type IV; tongue and groove long edges; 3/4 inch thick, unless noted otherwise.

E. Communications and Electrical Room Mounting Boards: PS 1 A-D plywood; 3/4 inch thick; flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.

## 2.04 ACCESSORIES

A. Fasteners and Anchors:
   1. Metal and Finish: Hot-dipped galvanized steel per ASTM A 153/A 153M for exterior, roof related and preservative-treated wood locations, unfinished steel elsewhere.

## 2.05 FACTORY WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
   1. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.
   2. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

B. Fire Retardant Treatment:
   1. Exterior Type: AWPA U1, Category UCFB, Commodity Specification H, chemically treated and pressure impregnated; capable of providing a maximum flame spread rating of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes both before and after accelerated weathering test performed in accordance with ASTM D2898.
      a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
      b. Do not use treated wood in direct contact with the ground.
   2. Interior Type A: AWPA U1, Use Category UCFA, Commodity Specification H, low temperature (low hygroscopic) type, chemically treated and pressure impregnated; capable of providing a maximum flame spread rating of 25 when tested in accordance with

ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes.

a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
b. Treat rough carpentry items as indicated .
c. Do not use treated wood in applications exposed to weather or where the wood may become wet.

C. Preservative Treatment:
1. Preservative Pressure Treatment of Lumber Above Grade: AWPA U1, Use Category UC3B, Commodity Specification A using waterborne preservative to 0.25 lb/cu ft retention.
a. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
b. Treat lumber exposed to weather.
c. Treat lumber in contact with roofing, flashing, or waterproofing.
d. Treat lumber in contact with masonry or concrete.
e. Treat lumber less than 18 inches above grade.
1) Treat lumber in other locations as indicated.
2. Preservative Pressure Treatment of Plywood Above Grade: AWPA U1, Use Category UC2 and UC3B, Commodity Specification F using waterborne preservative to 0.25 lb/cu ft retention.
a. Kiln dry plywood after treatment to maximum moisture content of 19 percent.
b. Treat plywood in contact with roofing, flashing, or waterproofing.
c. Treat plywood in contact with masonry or concrete.
d. Treat plywood less than 18 inches above grade.
e. Treat plywood in other locations as indicated.

## PART 3 EXECUTION

### 3.01 INSTALLATION - GENERAL

A. Select material sizes to minimize waste.

B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

### 3.02 BLOCKING, NAILERS, AND SUPPORTS

A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.

B. In framed assemblies that have concealed spaces, provide solid wood fireblocking as required by applicable local code, to close concealed draft openings between floors and between top story and roof/attic space; other material acceptable to code authorities may be used in lieu of solid wood blocking.

C. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.

D. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.

E. Specifically, provide the following non-structural framing and blocking:
1. Cabinets and shelf supports, as indicated on drawings.
2. Wall brackets, as indicated on drawings.
3. Handrails.
4. Grab bars.
5. Toilet room accessories.

### 3.03 ROOF-RELATED CARPENTRY

A. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.

### 3.04 INSTALLATION OF CONSTRUCTION PANELS

A. Roof Sheathing: Secure panels with long dimension perpendicular to framing members, with ends staggered and over firm bearing.
   1. At long edges use sheathing clips where joints occur between roof framing members.
   2. Screw panels to framing; staples are not permitted.

B. Wall Sheathing: Secure with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using nails, screws, or staples.

C. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24 inches on center on all edges and into studs in field of board.
   1. At fire-rated walls, install board over wall board indicated as part of the fire-rated assembly.
   2. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.
   3. Install adjacent boards without gaps.

### 3.05 SITE APPLIED WOOD TREATMENT

A. Apply preservative treatment compatible with factory applied treatment at site-sawn cuts, complying with manufacturer's instructions.

B. Allow preservative to dry prior to erecting members.

### 3.06 TOLERANCES

A. Variation from Plane (Other than Floors): 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

### 3.07 CLEANING

A. Waste Disposal: Comply with the requirements of Section 01 7419.
   1. Comply with applicable regulations.
   2. Do not burn scrap on project site.
   3. Do not burn scraps that have been pressure treated.
   4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or “waste-to-energy” facilities.

B. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.

C. Prevent sawdust and wood shavings from entering the storm drainage system.

**END OF SECTION**

**SECTION 06 2000**

**FINISH CARPENTRY**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Finish carpentry items.

B. Wood door frames.

C. Wood standing and running trim.

D. Plastic laminate panels.

E. Hardware and attachment accessories.

### 1.02 REFERENCE STANDARDS

A. ANSI A135.4 - American National Standard for Basic Hardboard; 2004.

B. ANSI A208.1 - American National Standard for Particleboard; 2009.

C. ANSI A208.2 - American National Standard for Medium Density Fiberboard for Interior Use; 2002.

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.

E. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014.

F. AWPA U1 - Use Category System: User Specification for Treated Wood; 2012.

G. BHMA A156.9 - American National Standard for Cabinet Hardware; 2010.

H. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; 2009.

I. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

J. PS 1 - Structural Plywood; 2009.

### 1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the work with plumbing rough-in, electrical rough-in, and installation of associated and adjacent components.

B. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

C. Coordinate with Vendor #01 locations of required blocking and supports for vendor supplied and installed items.

### 1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.

1. Provide the information required by AWI/AWMAC/WI Architectural Woodwork Standards.

### 1.05 QUALITY ASSURANCE

A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of experience.

### 1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect work from moisture damage.

## PART 2 PRODUCTS

### 2.01 FINISH CARPENTRY ITEMS

A. Quality Grade: Unless otherwise indicated provide products of quality specified by AWI/AWMAC/WI Architectural Woodwork Standards for Custom Grade.

B. Surface Burning Characteristics: Provide materials having fire and smoke properties as required by applicable code.

**2.02 SHEET MATERIALS**

A. Particleboard: ANSI A208.1; composed of wood chips, sawdust, or flakes of medium density, made with waterproof resin binders; of grade to suit application; sanded faces.

B. Medium-Density Fiberboard (MDF): ANSI A208.2, Grade 130.

C. Pegboard: Pressed wood fiber with resin binder, standard grade; 1/4 inch thick, with holes spaced at 1 inch on center in both directions.

**2.03 PLASTIC LAMINATE MATERIALS**

A. Plastic Laminate: NEMA LD 3, HGS; color as indicated; finish as selected.
   1. Casework and Countertops
      a. All countertops in which sinks occur shall have a core of exterior grade hardwood faced plywood or phenolic resin particleboard.
   2. Provided and installed by Vendor #01.

B. Low Pressure Laminate: Melamine; color and surface texture as selected.
   1. Provided and installed by Vendor #01.
   2. Provide finish "bottom" to cover fastener holes.

C. Laminate Adhesive: Type recommended by laminate manufacturer to suit application; not containing formaldehyde or other volatile organic compounds.

**2.04 FASTENINGS**

A. Adhesive for Purposes Other Than Laminate Installation: Suitable for the purpose; not containing formaldehyde or other volatile organic compounds.

B. Fasteners: Of size and type to suit application; use corrosion resistant fasteners for exterior locations.

**2.05 ACCESSORIES**

A. Lumber for Shimming and Blocking: Softwood lumber of any appropriate species.

B. Primer: Alkyd primer sealer.

C. Wood Filler: Solvent base, tinted to match surface finish color.

**2.06 HARDWARE**

A. Hardware provided and installed by Vendor #01.

B. Hardware: Comply with BHMA A156.9.

C. Shelf Standards and Brackets: No. 255/256 manufactured by Knape & Vogt.

D. Shelf Standards and Support Clips: No. 233/256 manufactured by Knape & Vogt.

E. Drawer Slides: No. 1300 manufactured by Knape & Vogt.

F. Hinges: Concealed casework hinge with self closing feature.

G. Pulls: 4 inch brushed aluminum wire pull.

H. Locks:
   1. Door: No. 0737 manufactured by Corbin Cabinet Locks.
   2. Drawer: No. 0738 manufactured by Corbin Cabinet Locks.

I. Coat Hooks:
   1. Provide 3 per changing room.
      a. Women's Changing Room: 3 inch long with disk end, #45KV81 manufactured by Econoco.
      b. Mens Changing Room: 1-5/8 inch aluminum, #IV581AM manufactured by HB Ives.

**2.07 FABRICATION**

A. Shop assemble work for delivery to site, permitting passage through building openings.

B. Cap exposed plastic laminate finish edges with material of same finish and pattern.

C. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

D. Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet from sink cut-outs.

**2.08 SHOP FINISHING**

A. Sand work smooth and set exposed nails and screws.

B. Apply wood filler in exposed nail and screw indentations.

C. On items to receive transparent finishes, use wood filler that matches surrounding surfaces and is of type recommended for the applicable finish.

D. Finish work in accordance with AWI/AWMAC/WI Architectural Woodwork Standards, Section 5 - Finishing for Grade specified and as follows:
   1. Transparent:
      a. System - 12, Polyurethane, Water-based.
      b. Stain: As indicated on drawings.
      c. Sheen: As indicated on drawings.
   2. Opaque:
      a. System - 4, Latex Acrylic, Water-based.
      b. Color: As indicated on drawings.
      c. Sheen: As indicated on drawings.

E. Back prime woodwork items to be field finished, prior to installation.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

A. Verify adequacy of backing and support framing.

B. Verify mechanical, electrical, and building items affecting work of this section are placed and ready to receive this work.

**3.02 INSTALLATION**

A. Install work in accordance with AWI/AWMAC/WI Architectural Woodwork Standards requirements for grade indicated.

B. Set and secure materials and components in place, plumb and level.

C. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.

D. Install trim with appropriate mechanical fasteners.

E. Install panels with concealed fasteners.

**3.03 PREPARATION FOR SITE FINISHING**

A. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth.

B. Site Finishing: See Section 09 9000.

C. Before installation, prime paint surfaces of items or assemblies to be in contact with cementitious materials.

**3.04 TOLERANCES**

A. Maximum Variation from True Position: 1/16 inch.

B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

**END OF SECTION**

**SECTION 06 6710**

**MOLDED POLYMER FABRICATIONS**

## PART 1 - GENERAL

### 1.01 SECTION INCLUDES:

A. Exterior Column Capitals

B. Decorative Sports Balls

### 1.02 QUALITY ASSURANCE:

A. Conflicting requirements: In the event of conflict between pertinent codes and regulations and the requirements of the referenced standards of these Specifications, the provisions of the more stringent shall govern.

B. Field measurements: Check actual locations of walls and other construction to which millwork fabrications must fit by accurate field measurements before fabrication. Show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

### 1.03 SUBMITTALS

A. Prior to installation, submit to the Owner's Representative for review the following:
   1. Shop drawings, fully dimensioned, showing all locations, markings, quantities, materials, sizes, and shapes. Indicate all methods of connecting, anchoring, fastening, bracing, and attaching to the work of other Trades.
   2. Written certification of compliance with all codes and standards.

### 1.04 PRODUCT HANDLING:

A. Stack and store components above ground on platforms, studs, or other supports. Protect from damage. Keep materials clean.

B. Store other materials in a weather-tight, dry place until ready for use.

C. Store packaged materials in their original, unbroken package or container.

### 1.05 - PROJECT CONDITIONS:

A. Field measurements: Check actual locations of walls and other construction to which molded polymer fabrications must fit by accurate field measurements before fabrication. Show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

### 1.06 - WARRANTY:

A. Provide the manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation or, other rights Owner may have under Contract Documents.
   1. Warranty period: Manufacturer one year limited warranty against defects in materials and workshop as stated in literature commencing on the Date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.01 APPROVED MANUFACTURER:

A. Manufacturer: Symmetry Foam Products. Vendor No. 24.
   1. No substitutions.

### 2.02 MATERIALS:

A. High density polymer.
   1. UV: Not affected.
   2. Solvent resistance: Resistant.
   3. Odor/Gas: Normal conditions release no gases, odor free.
   4. Vermin and fungus resistance: Resistant.
   5. Insulation: Greater insulating valve than comparable wood products.

6. High-density polymer comparable to kiln dried white pine millwork with higher skin density.
7. Moisture resistance: Non-water absorbing.
8. Fire rating: Fire rated Class I.
9. Finish:
    a. Factory coated with high quality exterior grade acrylic emulsion paint.
    b. Color as selected by the Owner's Representative.

B. System performance:
1. Provide molded polymer fabrications which have been manufactured, fabricated and installed to withstand loads required by the Project and to maintain performance criteria stated by the manufacturer without defects, damage or failure.
2. Test molded units per ASTM E84 for Class A requirements by UL or other testing and inspecting agency acceptable to authorities having jurisdiction.

## PART 3 - EXECUTION

### 3.01 PREPARATION:

A. Coordinate and furnish manufacturer's instructions and directions for installation.

B. Verify substrate conditions, which have been previously installed under other sections are acceptable for product installation in accordance with the manufacturer's instructions.

### 3.02 INSTALLATION:

A. Upon Owner's request, provide manufacturer's field service consisting of product use recommendations and periodic site visit for inspection of product installation in accordance with manufacturer's instruction.

B. Fastening to in-place construction: Provide anchorage devices and fasteners for securing molded polymer fabrications to in-place construction.

C. Cutting, fitting, and placement: Perform cutting, drilling, and fitting required for installation. Set molded polymer fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

D. Provide all labor, materials, equipment and services to furnish and install the molded polymer fabrications

### 3.03 CLEANING:

A. Remove temporary covering and protection of adjacent work areas. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instruction. Remove construction debris from project site and legally dispose of debris.

**END OF SECTION**

## SECTION 06 8316
## FIBERGLASS REINFORCED PANELING

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

A. Fiberglass reinforced plastic panels.

B. Trim.

#### 1.02 REFERENCE STANDARDS

A. ASTM D256 - Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics; 2010, with Editorial Revision (2015).

B. ASTM D2583 - Standard Test Method for Indentation Hardness of Rigid Plastics by Means of Barcol Impressor; 2013a.

C. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2012.

D. ASTM D5319 - Standard Specification for Glass-Fiber Reinforced Polyester Wall and Ceiling Panels; 2017.

E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.

#### 1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

A. Fiberglass Reinforced Plastic Panels:
   1. Crane Composites, Inc; Glasbord FSI: www.cranecomposites.com.

#### 2.02 PANEL SYSTEMS

A. Wall Panels at janitors wall:
   1. Panel Size: 4 x 6 feet.
   2. Panel Thickness: 0.075 inch.
   3. Surface Design: Smooth.
   4. Color: White.
   5. Attachment Method: Adhesive only, with trim and sealant in joints.

#### 2.03 MATERIALS

A. Panels: Fiberglass reinforced plastic (FRP), complying with ASTM D5319.
   1. Surface Burning Characteristics: Maximum flame spread index of 25 and smoke developed index of 450; when system tested in accordance with ASTM E84.
   2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
   3. Scratch Resistance: Barcol hardness score greater than 35, when tested in accordance with ASTM D2583.
   4. Impact Strength: Greater than 6 ft lb force per inch, when tested in accordance with ASTM D256.

B. Trim: Vinyl; color coordinating with panel.

C. Adhesive: Type recommended by panel manufacturer.

D. Sealant: Type recommended by panel manufacturer; white.

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verify existing conditions and substrate flatness before starting work.

B. Verify that substrate conditions are ready to receive the work of this section.

### 3.02 INSTALLATION - WALLS

A. Install panels in accordance with manufacturer's instructions.

B. Cut and drill panels with carbide tipped saw blades, drill bits, or snips.

C. Apply adhesive to the back side of the panel using trowel as recommended by adhesive manufacturer.

D. Apply panels to wall with seams plumb and pattern aligned with adjoining panels.

E. Install panels with manufacturer's recommended gap for panel field and corner joints.

F. Place trim on panel before fastening edges, as required.

G. Fill channels in trim with sealant before attaching to panel.

H. Install trim with adhesive and screws or nails, as required.

I. Seal gaps at floor, ceiling, and between panels with applicable sealant to prevent moisture intrusion.

J. Remove excess sealant after paneling is installed and prior to curing.

**END OF SECTION**

## SECTION 07 6200

## SHEET METAL FLASHING AND TRIM

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

A. Fabricated sheet metal items, including gravel stops, prefabricated copings, fascias, flashings, counterflashings, gutters, downspouts, and as indicated on drawings.

B. Sealants for joints within sheet metal fabrications.

C. Precast concrete splash pads.

#### 1.02 REFERENCE STANDARDS

A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2012.

B. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2015.

C. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels; 2013.

D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.

E. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.

F. ASTM B32 - Standard Specification for Solder Metal; 2008 (Reapproved 2014).

G. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.

H. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric); 2014.

I. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014a.

J. ASTM D226/D226M - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing; 2009.

K. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2012).

L. IBC Chapter 15 - Roof Assemblies and Rooftop Structures, Performance Requirements; International Building Code; current edition.

M. NRCA (RM) - The NRCA Roofing Manual; 2017.

N. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

O. SPRI ES-1 - Single-Ply Roofing Institute Wind Design Standard for Edge Systems with Low Slope Roofing Systems.

#### 1.03 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section.

#### 1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.

#### 1.05 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA Architectural Sheet Metal Manual or The NRCA Roofing and Waterproofing Manual recommendations and standard details, except as otherwise indicated.

B. Fabricator and Installer Qualifications: Company specializing in sheet metal work with 5 years of experience.

### 1.06 DELIVERY, STORAGE, AND HANDLING

A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.

B. Prevent contact with materials that could cause discoloration or staining.

### 1.07 WARRANTY

A. See Section 01780 - Closeout Submittals, for additional warranty requirements.

B. Provide manufacturer's standard material finish warranty, agreeing to repair or replace panels that show evidence of finish degradation, including fading, chalking, cracking, or peeling.
   1. Warranty period 10 years, non-prorated.

## PART 2 PRODUCTS

### 2.01 PREFABRICATED COPING MANUFACTURERS

A. Subject to compliance with specified requirements, the following are approved prefabricated coping manufacturers:
   1. OMG EdgeSystems; Continuous Cleat Coping System.
   2. Metal Era, Inc.; Perma-Tite Continuous Cleat Coping.
   3. Petersen Aluminum Corporation; PAC-Continuous Cleat Coping: www.pac-clad.com/sle.

### 2.02 EDGE SYSTEMS USED WITH LOW SLOPE ROOFING SYSTEMS

A. Edge System Requirements
   1. Metal edge to resist the design uplift pressures calculated according to:
      a. IBC Chapter 15 section on Performance Requirements.
      b. ANSI/SPRI ES-1.

### 2.03 PREFABRICATED COPING

A. Pre-Finished Aluminum: ASTM B209 (ASTM B209M); gage, .050 inch thick; plain finish shop pre-coated with Kynar-500 coating.
   1. Color: As indicated on drawings.
   2. Concealed joint splices: Finish to match finish of coping cap.
   3. Continuous cleat.
   4. Fasteners: No exposed fasteners permitted.

### 2.04 SHEET MATERIALS

A. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24 gage, (0.0239) inch thick base metal, shop pre-coated with PVDF coating.
   1. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system.
   2. Color: As indicated on drawings.

B. Aluminum: ASTM B209 (ASTM B209M); 20 gage, (0.032 inch) thick; anodized finish of color as selected.
   1. Clear Anodized Finish: AAMA 611 AA-M12C22A41 Class I clear anodic coating not less than 0.7 mils thick.

C. Pre-Finished Aluminum: ASTM B209 (ASTM B209M); 20 gage, (0.032 inch) thick; plain finish shop pre-coated with modified silicone coating.
   1. Modified Silicone Polyester Coating: Pigmented Organic Coating System, AAMA 2603; baked enamel finish system.
   2. Color: As indicated on drawings.

D. Stainless Steel: ASTM A666, Type 304 alloy, soft temper, 28 gage, (0.0156 inch) thick; smooth No. 4 - Brushed finish.

E. FABRICATION
   1. Form sections true to shape, accurate in size, square, and free from distortion or defects.

2. Fabricate cleats of same material as sheet, continuous, interlocking with sheet.
3. Form pieces in longest possible lengths.
4. Hem exposed edges on underside 1/2 inch; miter and seam corners.
5. Form material with flat lock seams, except where otherwise indicated. At moving joints, use butt joints with concealed backup plate.
   a. Fabricate concealed backup plate, minimum 12 inch long.
6. Fabricate corners from one piece with minimum 24 inch long legs; solder for rigidity, seal with sealant.
7. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.

F. GUTTER AND DOWNSPOUT FABRICATION
1. Gutters: SMACNA (ASMM), Rectangular profile.
2. Downspouts: Rectangular profile.
3. Gutters and Downspouts: Size for rainfall intensity determined by a storm occurrence of 1 in 10 years in accordance with SMACNA (ASMM).
4. Accessories: Profiled to suit gutters and downspouts.
   a. Anchorage Devices: In accordance with SMACNA (ASMM) requirements.
   b. Downspout Supports: Brackets & Straps.
5. Splash Pads: Precast concrete type, of size and profile appropriate to the application; minimum 3000 psi at 28 days, with minimum 5 percent air entrainment.
6. Seal metal joints.

G. ACCESSORIES
1. Fasteners: Galvanized steel, with soft neoprene washers.
2. Underlayment: ASTM D226/D226M, organic roofing felt, Type I (No. 15).
3. Primer: Zinc chromate type.
4. Concealed Sealants: Non-curing butyl sealant.
5. Exposed Sealants: ASTM C920; elastomeric sealant, with minimum movement capability as recommended by manufacturer for substrates to be sealed; color to match adjacent material.
6. Plastic Cement: ASTM D4586/D4586M, Type I.
7. Reglets: Surface mounted or recessed as detailed type, Stainless Steel.
8. Solder: ASTM B32; Sn50 (50/50) type.

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.

B. Verify roofing termination and base flashings are in place, sealed, and secure.

### 3.02 PREPARATION

A. Install starter and edge strips, and cleats before starting installation.

B. Install surface mounted reglets true to lines and levels, and seal top of reglets with sealant.

C. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.

### 3.03 INSTALLATION

A. Fasten metal edge systems to resist the design uplift pressures calculated according to:
1. IBC Chapter 15 section on Performance Requirements.
2. ANSI/SPRI ES-1.

B. Install coping cap in accordance with manufacturer's instruction.

C. Insert flashings into reglets to form tight fit; secure in place with lead wedges; pack remaining spaces with lead wool; seal flashings into reglets with sealant.

D. Secure flashings in place using concealed fasteners, and use exposed fasteners only where permitted..

E. Apply plastic cement compound between metal flashings and felt flashings.

F. Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.

G. Roof Edge Flashing (Gravel Stop), and Fascia Cap Joint Style: Butt, with 12 inch wide concealed backup plates.

H. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection.
   1. Provide two rows of butyl sealant on backup plate each side of movement joint.

I. Seal metal joints watertight.

J. Secure gutters and downspouts in place with concealed fasteners.

K. Slope gutters 1/4 inch per 10 feet, minimum.

L. Set splash pads under downspouts.

**3.04 FIELD QUALITY CONTROL**

A. See Section 01 4000 - Quality Requirements, for field inspection requirements.

B. Inspect the work during installation to ascertain compliance with specified requirements.

**3.05 SCHEDULE**

A. Gravel stop and Fascia: Prefinished galvanized steel.

B. Gutters and Downspouts: Prefinished galvanized steel.

C. Scuppers: Prefinished galvanized steel.

D. Sill and head flashings, including transition flashing between materials: Prefinished aluminum.

E. Exposed trim & accessories related to aluminum framed storefronts: Anodized aluminum, color to match storefront.

F. Counterflashings at Roofing Terminations (over roofing base flashings): Stainless steel

G. Counterflashings at Curb-Mounted Roof Items, including skylights and roof hatches: Match material of item being flashed.

**END OF SECTION**

## SECTION 07 8400
## FIRESTOPPING

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Firestopping systems.

B. Firestopping of all joints and penetrations in fire-resistance rated and smoke-resistant assemblies .

### 1.02 REFERENCE STANDARDS

A. ASTM E814 - Standard Test Method for Fire Tests of Through-Penetration Fire Stops; 2013a.

B. ASTM E1966 - Standard Test Method for Fire Resistive Joint Systems; 2007 (Reapproved 2011).

C. ASTM E2307 - Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-story Test Apparatus; 2015a.

D. ASTM E2837 - Standard Test Method for Determining the Fire Resistance of Continuity Head-of-Wall Joint Systems Installed Between Rated Wall Assemblies and Nonrated Horizontal Assemblies; 2013.

E. ITS (DIR) - Directory of Listed Products; current edition.

F. FM (AG) - FM Approval Guide; current edition.

G. UL 2079 - Standard for Tests for Fire Resistance of Building Joint Systems; Current Edition, Including All Revisions.

H. UL (FRD) - Fire Resistance Directory; current edition.

### 1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Schedule of Firestopping: List each type of penetration, fire rating of the penetrated assembly, and firestopping test or design number.

C. Product Data: Provide data on product characteristics, performance ratings, and limitations.

### 1.04 QUALITY ASSURANCE

A. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated.
   1. Listing in UL (FRD), FM (AG), or ITS (DIR) will be considered as constituting an acceptable test report.
   2. Valid evaluation report published by ICC Evaluation Service, Inc. (ICC-ES) at www.icc-es.org will be considered as constituting an acceptable test report.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years experience.

C. Installer Qualifications: Company specializing in performing the work of this section and:
   1. Verification of minimum three years experience installing work of this type.

### 1.05 FIELD CONDITIONS

A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation. Maintain minimum temperature before, during, and for 3 days after installation of materials.

B. Provide ventilation in areas where solvent-cured materials are being installed.

### PART 2 PRODUCTS

### 2.01 MATERIALS

A. Firestopping Materials: Any materials meeting requirements.

B. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Provide type of materials as required for tested firestopping assembly.

C. Fire Ratings: See Drawings for required ratings.

**2.02 FIRESTOPPING ASSEMBLY REQUIREMENTS**

A. Perimeter Fire Containment Firestopping: Use any system that has been tested according to ASTM E2307 to have fire resistance F Rating equal to required fire rating of the floor assembly.

B. Head-of-Wall Joint System Firestopping at Joints Between Fire-Rated Wall Assemblies and Non-Rated Horizontal Assemblies: Use any system that has been tested according to ASTM E2837 to have fire resistance F Rating equal to required fire rating of floor or wall, whichever is greater.

C. Floor-to-Floor, Wall-to-Wall, and Wall-to-Floor Joints, Except Perimeter, Where Both Are Fire-Rated: Use any system that has been tested according to ASTM E1966 or UL 2079 to have fire resistance F Rating equal to required fire rating of the assembly in which the joint occurs.

D. Through Penetration Firestopping: Use any system that has been tested according to ASTM E814 to have fire resistance F Rating equal to required fire rating of penetrated assembly.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

A. Verify openings are ready to receive the work of this section.

**3.02 PREPARATION**

A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter that could adversely affect bond of firestopping material.

B. Remove incompatible materials that could adversely affect bond.

C. Install backing materials to arrest liquid material leakage.

**3.03 INSTALLATION**

A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.

B. Do not cover installed firestopping until inspected by authorities having jurisdiction.

C. Install labeling required by code.

**3.04 CLEANING**

A. Clean adjacent surfaces of firestopping materials.

**3.05 PROTECTION**

A. Protect adjacent surfaces from damage by material installation.

**END OF SECTION**

# SECTION 07 9200
# JOINT SEALANTS

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Nonsag gunnable joint sealants.

B. Self-leveling pourable joint sealants.

C. Joint backings and accessories.

### 1.02 REFERENCE STANDARDS

A. ASTM C834 - Standard Specification for Latex Sealants; 2014.

B. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014a.

C. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016.

D. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants; 2008 (Reapproved 2012).

E. ASTM C1311 - Standard Specification for Solvent Release Sealants; 2014.

F. ASTM C1521 - Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints; 2013.

G. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness; 2005 (Reapproved 2010).

### 1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data for Sealants: Submit manufacturer's technical data sheets for each product to be used, that includes the following.
   1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
   2. List of backing materials approved for use with the specific product.
   3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
   4. Substrates the product should not be used on.
   5. Substrates for which use of primer is required.

C. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.

### 1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years experience.

B. Installer Qualifications: Company specializing in performing the work of this section and with at least three years of experience.

C. Field Adhesion Tests of Joints: Test for adhesion using most appropriate method in accordance with ASTM C1521, or other applicable method as recommended by manufacturer.

### 1.05 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Correct defective work within a five year period after Date of Substantial Completion.

C. Warranty: Include coverage for installed sealants and accessories that fail to achieve watertight seal , exhibit loss of adhesion or cohesion, or do not cure.

## PART 2 PRODUCTS

### 2.01 JOINT SEALANT APPLICATIONS

A. Scope:

1. Exterior Joints: Seal open joints, whether or not the joint is indicated on the drawings, unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to, the following items.
    a. Wall expansion and control joints.
    b. Joints between door, window, and other frames and adjacent construction.
    c. Joints between different exposed materials.
    d. Openings below ledge angles in masonry.
    e. Other joints indicated below.
2. Interior Joints: Do not seal interior joints unless specifically indicated to be sealed. Interior joints to be sealed include, but are not limited to, the following items.
    a. Joints between door, window, and other frames and adjacent construction.
    b. Other joints indicated below.
3. Do not seal the following types of joints.
    a. Intentional weepholes in masonry.
    b. Joints indicated to be treated with manufactured expansion joint cover or some other type of sealing device.
    c. Joints where sealant is specified to be provided by manufacturer of product to be sealed.
    d. Joints where installation of sealant is specified in another section.
    e. Joints between suspended panel ceilings/grid and walls.

B. Exterior Joints: Use non-sag polyurethane sealant, unless otherwise indicated.
1. Lap Joints in Sheet Metal Fabrications: Butyl rubber, non-curing.
2. Lap Joints between Manufactured Metal Panels: Butyl rubber, non-curing.
3. Control and Expansion Joints in Concrete Paving: Self-leveling polyurethane "traffic-grade" sealant.

C. Interior Joints: Use non-sag polyurethane sealant, unless otherwise indicated.
1. Wall and Ceiling Joints in Non-Wet Areas: Acrylic emulsion latex sealant.
2. Wall and Ceiling Joints in Wet Areas: Non-sag polyurethane sealant for continuous liquid immersion.
3. Floor Joints in Wet Areas: Non-sag polyurethane "non-traffic-grade" sealant suitable for continuous liquid immersion.
4. Joints between Fixtures in Wet Areas and Floors, Walls, and Ceilings: Mildew-resistant silicone sealant; white.
5. Narrow Control Joints in Interior Concrete Slabs: Self-leveling epoxy sealant.
6. Other Floor Joints: Self-leveling polyurethane "traffic-grade" sealant.

D. Interior Wet Areas: restrooms; fixtures in wet areas include plumbing fixtures.

## 2.02 JOINT SEALANTS - GENERAL

A. Colors: As specified below. Custom colors may be required to match adjacent surfaces.

## 2.03 NONSAG JOINT SEALANTS

A. Non-Staining Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
1. Movement Capability: Plus and minus 50 percent, minimum.
2. Non-Staining To Porous Stone: Non-staining to light-colored natural stone when tested in accordance with ASTM C1248.
3. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.
4. Color: Match adjacent finished surfaces.

B. Mildew-Resistant Silicone Sealant: ASTM C920, Grade NS, Uses M and A; single component, mildew resistant; not expected to withstand continuous water immersion or traffic.
1. Color: Clear.

C. Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single component; not expected to withstand continuous water immersion or traffic.

1. Movement Capability: Plus and minus 25 percent, minimum.
2. Color: Match adjacent finished surfaces.

D. Polyurethane Sealant for Continuous Water Immersion: ASTM C920, Grade NS, Uses M and A; single component; explicitly approved by manufacturer for continuous water immersion; suitable for traffic exposure when recessed below traffic surface .
1. Movement Capability: Plus and minus 35 percent, minimum.
2. Color: Match adjacent finished surfaces.

E. Acrylic Emulsion Latex: Water-based; ASTM C834, single component, non-staining, non-bleeding, non-sagging; not intended for exterior use.
1. Color: Standard colors matching finished surfaces.

F. Non-Curing Butyl Sealant: Solvent-based; ASTM C1311; single component, non-sag, non-skinning, non-hardening, non-bleeding; vapor-impermeable; intended for fully concealed applications.

### 2.04 SELF-LEVELING SEALANTS

A. Self-Leveling Polyurethane Sealant: ASTM C920, Grade P, Uses M and A; single component; explicitly approved by manufacturer for traffic exposure; not expected to withstand continuous water immersion .
1. Movement Capability: Plus and minus 25 percent, minimum.
2. Color: Gray.

B. Self-Leveling Polyurethane Sealant for Continuous Water Immersion: Polyurethane; ASTM C920, Grade P, Uses M and A; single component; explicitly approved by manufacturer for traffic exposure and continuous water immersion.
1. Movement Capability: Plus and minus 25 percent, minimum.
2. Color: Gray.

C. Semi-Rigid Self-Leveling Epoxy Joint Filler: Epoxy or epoxy/polyurethane copolymer; intended for filling cracks and control joints not subject to significant movement; rigid enough to support concrete edges under traffic.
1. Composition: Multi-component, 100 percent solids by weight.
2. Hardness: Minimum of 85 (Shore A) or 35 (Shore D), when tested in accordance with ASTM D2240 after 7 days.
3. Color: Concrete gray.
4. Joint Width, Minimum: 1/8 inch.
5. Joint Width, Maximum: 1/4 inch.

### 2.05 ACCESSORIES

A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.

B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.

C. Joint Cleaner: Non-corrosive and non-staining type, type recommended by sealant manufacturer; compatible with joint forming materials.

D. Primers: Type recommended by sealant manufacturer to suit application; non-staining.

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verify that joints are ready to receive work.

B. Verify that backing materials are compatible with sealants.

C. Verify that backer rods are of the correct size.

### 3.02 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.

B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.

C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.

D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

**3.03 INSTALLATION**

A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Perform installation in accordance with ASTM C1193.

C. Install bond breaker backing tape where backer rod cannot be used.

D. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.

E. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.

F. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

G. Concrete Floor Joint Filler: After full cure, shave joint filler flush with top of concrete slab.

**3.04 FIELD QUALITY CONTROL**

A. Perform field quality control inspection/testing as specified in PART 1 under QUALITY ASSURANCE article.

B. Remove and replace failed portions of sealants using same materials and procedures as indicated for original installation.

**END OF SECTION**

## SECTION 08 1113
## HOLLOW METAL DOORS AND FRAMES

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Non-fire-rated hollow metal doors and frames.

B. Hollow metal frames for wood doors.

C. Fire-rated hollow metal doors and frames.

D. Thermally insulated hollow metal doors with frames.

E. Accessories, including glazing, louvers, and matching panels.

### 1.02 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

B. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2011.

C. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2014.

D. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2011.

E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.

F. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2015.

G. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2014.

H. BHMA A156.115 - American National Standard for Hardware Preparation in Steel Doors and Steel Frames; 2016.

I. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2009.

J. ITS (DIR) - Directory of Listed Products; current edition.

K. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames; 2002.

L. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames; 2011.

M. NAAMM HMMA 840 - Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames; 2007.

N. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames; 2006.

O. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2016.

P. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives; 2016.

Q. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2012.

R. SDI 117 - Manufacturing Tolerances for Standard Steel Doors and Frames; 2013.

S. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.

T. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

U. UL 1784 - Standard for Air Leakage Tests of Door Assemblies; Current Edition, Including All Revisions.

### 1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes.

C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.

### 1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Provide hollow metal doors and frames from SDI Certified manufacturer: www.steeldoor.org/sdicertified.php.

### 1.05 DELIVERY, STORAGE, AND HANDLING

A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.

B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. Hollow Metal Doors and Frames in this section are to be purchased from National Account Vendor #4

### 2.02 DESIGN CRITERIA

A. Requirements for Hollow Metal Doors and Frames:
   1. Steel used for fabrication of doors and frames shall comply with one or more of the following requirements; Galvannealed steel conforming to ASTM A653/A653M, cold-rolled steel conforming to ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel conforming to ASTM A1011/A1011M, Commercial Steel (CS) Type B for each.
   2. Accessibility: Comply with ICC A117.1 and ADA Standards.
   3. Door Top Closures: Flush end closure channel, with top and door faces aligned.
   4. Door Edge Profile: Manufacturers standard for application indicated.
   5. Typical Door Face Sheets: Flush.
   6. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings. Style: Manufacturers standard.
   7. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.

B. Hollow Metal Panels: Same construction, performance, and finish as doors.

C. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

### 2.03 HOLLOW METAL DOORS

A. Door Finish: Factory primed and field finished.

B. Exterior Doors: Thermally insulated.
   1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
      a. Level 3 - Extra Heavy-duty.
      b. Physical Performance Level A, 1,000,000 cycles; in accordance with ANSI/SDI A250.4.
      c. Model 2 - Seamless.
      d. Door Face Metal Thickness: 16 gage, 0.053 inch, minimum.
      e. Zinc Coating: A60/ZF180 galvannealed coating; ASTM A653/A653M.

2. Core Material: Polyurethane, 1.8 lbs/cu ft minimum density.
3. Door Thickness: 1-3/4 inch, nominal.
4. Weatherstripping: Refer to Section 08 7100.

C. Interior Doors, Non-Fire Rated:
1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
a. Level 3 - Extra Heavy-duty.
b. Physical Performance Level A, 1,000,000 cycles; in accordance with ANSI/SDI A250.4.
c. Model 2 - Seamless.
d. Door Face Metal Thickness: 16 gage, 0.053 inch, minimum.
2. Door Core Material: Manufacturers standard core material/construction and in compliance with requirements.
3. Door Thickness: 1-3/4 inch, nominal.

D. Fire-Rated Doors:
1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
a. Level 3 - Extra Heavy-duty.
b. Physical Performance Level A, 1,000,000 cycles; in accordance with ANSI/SDI A250.4.
c. Model 2 - Seamless.
d. Door Face Metal Thickness: 16 gage, 0.053 inch, minimum.
2. Fire Rating: As indicated on Door Schedule, tested in accordance with UL 10C and NFPA 252 ("positive pressure fire tests").
3. Provide units listed and labeled by UL (DIR) or ITS (DIR).
a. Attach fire rating label to each fire rated unit.
4. Smoke and Draft Control Doors (as indicated on drawings): Self-closing or automatic closing doors in accordance with NFPA 80 and NFPA 105, with fire-resistance-rated wall construction rated the same or greater than the fire-rated doors, and the following;
a. Maximum Air Leakage: 3.0 cfm/sq ft of door opening at 0.10 inch w.g. pressure, when tested in accordance with UL 1784 at both ambient and elevated temperatures.
b. Gasketing: Provide gasketing or edge sealing as necessary to achieve leakage limit.
c. Label: Include the "S" label on fire-rating label of door.
5. Door Core Material: Manufacturers standard core material/construction in compliance with requirements.
6. Door Thickness: 1-3/4 inch, nominal.

## 2.04 HOLLOW METAL FRAMES

A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.

B. Frame Finish: Factory primed and field finished.

C. Exterior Door Frames: Face welded type.
1. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with A40/ZF120 coating.
2. Frame Metal Thickness: 16 gage, 0.053 inch, minimum.
3. Weatherstripping: Separate, see Section 08 7100.

D. Interior Door Frames, Non-Fire Rated: As indicated on Door Schedule.
1. Terminated Stops: Provide at interior doors; closed end stop terminated 6 inch, maximum, above floor at 45 degree angle.
2. Frame Metal Thickness: 16 gage, 0.053 inch, minimum.

E. Door Frames, Fire-Rated: Face welded type.
1. Fire Rating: Same as door, labeled.
2. Terminated Stops: Provide at interior doors; closed end stop terminated 6 inch, maximum, above floor at 45 degree angle.
3. Frame Metal Thickness: 16 gage, 0.053 inch, minimum.

F. Frames for Wood Doors: Comply with frame requirements in accordance with corresponding door.

G. Mullions for Pairs of Doors: Removable type, with profile similar to jambs.

H. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.

I. Frames in Masonry Walls: Size to suit masonry coursing with head member 4 inch high to fill opening without cutting masonry units.

J. Frames Wider than 48 inches: Reinforce with steel channel fitted tightly into frame head, flush with top.

**2.05 FINISHES**

A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

B. Bituminous Coating: Asphalt emulsion or other high-build, water-resistant, resilient coating.

**2.06 ACCESSORIES**

A. Louvers: Roll formed steel with overlapping frame; finish same as door components; factory-installed.
   1. In Fire-Rated Doors: UL (DIR) or ITS (DIR) listed fusible link louver, same rating as door.
   2. Style: Standard straight slat blade.
   3. Fasteners: Concealed fasteners.

B. Glazing: As specified in Section 08 8000, factory installed.

C. Removable Stops: Formed sheet steel, , mitered corners; prepared for countersink style tamper proof screws.

D. Astragals for Double Doors: Specified in Section 08 7100.

E. Grout for Frames: Portland cement grout with maximum 4 inch slump for hand troweling; thinner pumpable grout is prohibited.

F. Silencers: Resilient rubber, fitted into drilled hole; provide three on strike side of single door, three on center mullion of pairs, and two on head of pairs without center mullions.

G. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Verify that finished walls are in plane to ensure proper door alignment.

**3.02 PREPARATION**

A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

**3.03 INSTALLATION**

A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.

B. Install fire rated units in accordance with NFPA 80.

C. Coordinate frame anchor placement with wall construction.

D. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.

E. Install door hardware as specified in Section 08 7100.

F. Comply with glazing installation requirements of Section 08 8000.

G. Coordinate installation of electrical connections to electrical hardware items.

### 3.04 TOLERANCES

A. Clearances Between Door and Frame: Comply with related requirements of specified frame standards or custom guidelines indicated in accordance with SDI 117 or NAAMM HMMA 861.

B. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

### 3.05 ADJUSTING

A. Adjust for smooth and balanced door movement.

**END OF SECTION**

# SECTION 08 1416
# FLUSH WOOD DOORS

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Flush wood doors; flush configuration; non-rated.

### 1.02 REFERENCE STANDARDS

A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014.

B. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards, U.S. Version 3.0; 2016.

### 1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.

C. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing and other details.

D. Warranty, executed in Owner's name.

### 1.04 DELIVERY, STORAGE, AND HANDLING

A. Package, deliver and store doors in accordance with specified quality standard.

B. Accept doors on site in manufacturer's packaging. Inspect for damage.

C. Protect doors with resilient packaging sealed with heat shrunk plastic. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges with tinted sealer if stored more than one week. Break seal on site to permit ventilation.

### 1.05 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Interior Doors: Provide manufacturer's warranty for the life of the installation.

C. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. Flush wood doors in this section are to be purchased from National Account Vendor #4.

### 2.02 DOORS AND PANELS

A. Doors: Refer to drawings for locations and additional requirements.
   1. Quality Standard: Premium Grade, Heavy Duty performance, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
   2. Wood Veneer Faced Doors: 5-ply unless otherwise indicated.

B. Interior Doors: 1-3/4 inches thick unless otherwise indicated; flush construction.
   1. Provide solid core doors at each location.

### 2.03 DOOR AND PANEL CORES

A. Non-Rated Solid Core Doors: Type particleboard core (PC), plies and faces as indicated.

### 2.04 DOOR FACINGS

A. Veneer Facing for Opaque Finish: Primecoat 6 sides hardboard skin, in compliance with indicated quality standard.

### 2.05 DOOR CONSTRUCTION

A. Fabricate doors in accordance with door quality standard specified.

B. Cores Constructed with stiles and rails:
   1. Provide solid blocks at lock edge and top of door for closer for hardware reinforcement.
   2. Provide solid blocking for other throughbolted hardware.

C. Where supplementary protective edge trim is required, install trim after veneer facing has been applied full-width.

D. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.

E. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.
   1. Exception: Doors to be field finished.

F. Provide edge clearances in accordance with the quality standard specified.

**2.06 ACCESSORIES**

A. Wood Door Frames: As specified in Section 06 2000.

B. Door Hardware: As specified in Section 08 7100.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

**3.02 INSTALLATION**

A. Install doors in accordance with manufacturer's instructions and specified quality standard.

B. Field-Finished Doors: Trimming to fit is acceptable.
   1. Adjust width of non-rated doors by cutting equally on both jamb edges.
   2. Trim maximum of 3/4 inch off bottom edges.

C. Use machine tools to cut or drill for hardware.

D. Coordinate installation of doors with installation of frames and hardware.

**3.03 TOLERANCES**

A. Conform to specified quality standard for fit and clearance tolerances.

B. Conform to specified quality standard for telegraphing, warp, and squareness.

**3.04 ADJUSTING**

A. Adjust doors for smooth and balanced door movement.

B. Adjust closers for full closure.

**END OF SECTION**

## SECTION 08 3100
## ACCESS DOORS AND PANELS

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Wall and ceiling access door and frame units.

### 1.02 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work.

### PART 2 PRODUCTS

### 2.01 ACCESS DOORS AND PANELS ASSEMBLIES

A. Wall-Mounted Units:
   1. Material: Steel.
   2. Size: As indicated on the drawings or as necessary to allow access to concealed items.
   3. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.
   4. Gypsum Board Mounting Criteria: Provide drywall bead frame with door surface flush with wall surface.

B. Wall-Mounted Units in Wet Areas and Exterior:
   1. Material: Steel, hot-dipped zinc, or zinc-aluminum-alloy coated.
   2. Size: As indicated on the drawings or as necessary to allow access to concealed items.
   3. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.
   4. Gypsum Board Mounting Criteria: Provide drywall bead frame with door surface flush with wall surface.
   5. In Masonry, Tile, Concrete, EIFS or other surfaces Mounting Criteria: Provide surface-mounted frame with door surface flush with frame surface.

C. Ceiling-Mounted Units, Unless Otherwise Indicated: Same type as for walls.
   1. Material: Steel.
   2. Material: Steel, hot-dipped zinc or zinc-aluminum-alloy coated, for use in wet locations and exterior.
   3. Size: As indicated on the drawings or as necessary to allow access to concealed items.
   4. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.

### 2.02 WALL AND CEILING MOUNTED UNITS

A. Manufacturers: Subject to compliance with specified requirements, the following are approved manufacturers:
   1. ACUDOR Products Inc: www.acudor.com/#sle.
   2. Babcock-Davis; _____: www.babcockdavis.com/#sle.
   3. Cendrex, Inc: www.cendrex.com/#sle.
   4. Milcor, Inc; ____: www.milcorinc.com.
   5. Nystrom, Inc; _____: www.nystrom.com/#sle.
   6. Substitutions: See Section 01 6000 - Product Requirements.

B. Wall and Ceiling Mounted Units: Factory fabricated door and frame, fully assembled units with corner joints welded, filled and ground flush; square and without rack or warp; coordinate requirements with type of installation assembly being used for each unit.
   1. Style: Exposed frame with door surface flush with frame surface.
      a. Gypsum Board Mounting Criteria: Use drywall bead type frame.
   2. Door Style: Single thickness with rolled or turned in edges.
   3. Heavy Duty Frames: 14 gage, 0.0747 inch, minimum thickness.
   4. Single Steel Sheet Door Panels: 1/16 inch, minimum thickness.
   5. Heavy Duty Single Steel Sheet Door Panels: 14 gage, 0.0747 inch, minimum thickness.

6. Steel Finish: Primed.
7. Hardware:
    a. Hinges for Non-Fire-Rated Units: Concealed, constant force closure spring type.
    b. Latch/Lock: Screw driver slot for quarter turn cam latch.

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verify that rough openings are correctly sized and located.

### 3.02 PREPARATION

A. Clean surfaces thoroughly prior to proceeding with this work.

B. Prepare surfaces using methods recommended by manufacturer for applicable substrates in accordance with project conditions.

### 3.03 INSTALLATION

A. Install units in accordance with manufacturer's instructions.

B. Install frames plumb and level in openings, and secure units rigidly in place.

C. Position units to provide convenient access to concealed equipment when necessary.

**END OF SECTION**

**SECTION 08 7100**

**DOOR HARDWARE**

## PART 1 GENERAL

### 1.01 SCOPE

A. Provide all of the labor, materials, equipment and services required to furnish and install the finish hardware.

B. Items not specifically mentioned, though necessary to the completion of the Work, shall be provided and shall be of equal quality and design to those specified items.

C. No extras will be allowed unless covered by a written order issued by the Owner (See Section 00550 for definition) and the AOR.

D. The General Contractor to whom the hardware award is made is responsible for providing templates and all necessary information pertaining to the installation of the hardware.

### 1.02 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's catalog literature for each type of hardware, marked to clearly show products to be furnished for this project, and includes construction details, material descriptions, finishes, and dimensions and profiles of individual components.

C. Shop Drawings - Door Hardware Schedule: Submit detailed listing that includes each item of hardware to be installed on each door. Use door numbering scheme as included in Contract Documents.
   1. Prepared by National Account Vendor #4.
   2. Provide complete description for each door listed.

### 1.03 QUALITY ASSURANCE

A. Conform to the following:
   1. American National Standards Institute (ANSI)
   2. American Society of Hardware Consultants (ASHC)
   3. Builders Hardware Manufacturers Association (BHMA)
   4. Federal Specifications (FS)
   5. National Builders Hardware Association (NBHA)

B. Supplier: All material in this section is to be purchased from National Account Vendor #4; (Refer to specific door specification sections for additional hardware requirements provided by other vendors.)

C. Fire-rated openings:
   1. Provide hardware for fire-rated openings in compliance with NFPA Standard No. 80. Provide only hardware which has been tested and listed by UL for types and sizes of doors required and complies with requirements of door and door frame labels.
   2. Where emergency exit devices are required on fire-rated doors, provide UL label on exit devices indicating "Fire Exit Hardware".

D. All hardware shall be provided in accordance with the requirements of the Americans with Disabilities Act (ADA).

### 1.04 DELIVERY, STORAGE, AND HANDLING

A. Packaging:
   1. Furnish all finish hardware with each unit clearly marked or numbered in accordance with the hardware schedule.
   2. Pack each item complete with all necessary pieces and fasteners.
   3. Properly wrap and cushion each item to prevent scratches during delivering and storage.

B. Delivery: Deliver all finish hardware to the installers in a timely manner to ensure orderly progress of the total Work.

## 1.05 JOB CONDITIONS

A. Coordinate hardware with other work. Tag each item or package separately, with identification related to the final hardware schedule, and include basic installation design for use on doors and frames of the thicknesses, profile, swing, security and similar requirements indicated, as necessary for proper installation and function. Deliver individually packaged hardware items at the proper times to the proper locations (shop or Project site) for installation.

B. Furnish all required templates, reinforcing units, and information as necessary to properly reinforce, drill and tap as required for proper attachment and anchorage, where necessary, physical templates shall be furnished.

# PART 2 PRODUCTS

## 2.01 FASTENERS

A. Furnish all finish hardware with all necessary screws, bolts, and other fasteners of suitable size and type to anchor the hardware in position for long life under hard use.

B. Furnish fastenings where necessary with expansion shields, toggle bolts, sex bolts, and other anchors approved by the AOR, according to the materials to which the hardware is to be applied and the recommendations of the hardware manufacturer.

C. All fastenings shall harmonize with the hardware as to material and finish.

## 2.02 FINISH

A. As specified in the hardware sets.

B. Door closers and brackets shall have commercial sprayed finish to match other hardware.

## 2.03 KEYING

A. Keying: All locks shall be keyed into a construction master key system. Vendor No. 4 will furnish 5 construction master keys, and 1 control key to Contractor who will later give to the Loss Prevention Representative at turnover. Vendor No. 4 will coordinate with Loss Prevention Department on quantities of final keys and final cores based on prototypical quantities as well as site specific needs. All permanent cores and keys will be shipped to the Loss Prevention Representative via overnight delivery to arrive at least a week before “the fixture date.”

B. Mounting heights: The guide for mounting hardware shall be the recommendations as set forth the DHI pamphlet “Recommended Locations of Builders Hardware”.

C. Fitting: Hardware shall be accurately and properly fitted. Exposed parts shall be removed until after painters finishing is completed, and after painting is completed, shall be reinstalled.

D. Hardware found defective in materials and installation shall be replaced, reworked, or otherwise made good as required.

E. The following shall be considered as defective materials:
   1. Unauthorized substitute.
   2. Items delivered with missing, broken, damaged or defaced parts.
   3. Items of incorrect hand or function.

F. Keying requirements for doors:
   1. Provide removable cylinders on all doors except fitting room locksets which will be keyed separately.

## 2.04 KEY CABINET

A. Provide complete with all systems components and instructions. Cabinet capacity shall be to 50% in excess of actual requirements.

B. Provided by Vendor No. 4.

C. Location: See Drawings.

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verify that doors and frames are ready to receive this work; labeled, fire-rated doors and frames are properly installed, and dimensions are as indicated on shop drawings.

B. Verify that electric power is available to power operated devices and of correct characteristics.

### 3.02 INSTALLATION

A. Mount hardware units at heights indicated in "Recommended Locations for Builders Hardware for Standard Steel Doors and Frames" by the Door and Hardware Institute, except as specifically indicated or required to comply with governing regulations, and except as may be otherwise directed by AOR.

B. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Wherever cutting and fitting is required to install hardware onto or into surfaces that are later to be painted or finishedin another way, coordinate removal, storage and reinstallation or application of surface protections with finishing work specified in the Division 9 sections. Do not install surface- mounted items until finishes have been completed on the substrate.

C. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.

D. Drill and countersink units that are not factory- prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

### 3.03 ADJUST AND CLEAN

A. Adjust and clean each operating item of hardware and each door, to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate freely and smoothly as intended for the application made.

B. Final adjustment: When hardware installations are made more than one month prior to acceptance or occupancy of a space, return to the work the week prior to acceptance or occupancy, and make final check and adjustment of all hardware items. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

C. Instruct DSG's Personnel in proper adjustment and maintenance of hardware and hardware finishes, during the final adjustment of hardware.

D. Continued maintenance service: Approximately six months after the acceptance of hardware in each area, the Installer, accompanied by the representative of the latch and lock manufacturer, shall return to the project and re- adjust every item of hardware to restore proper function of doors and hardware. Consult with and instruct DSG's personnel in recommended additions to the maintenance procedures. Replace hardware items that have deteriorated or failed due to faulty design, materials or installation of hardware units. Prepare a written report of current and predictable problems (of substantial nature) in the performance of the hardware.

## PART 4 HARDWARE SCHEDULE

**4.01 THE HARDWARE SCHEDULE DESCRIBES THE REQUIRED HARDWARE FOR TYPICAL LOCATIONS. THE GENERAL CONTRACTOR SHALL USE IT AS A GUIDE ONLY AND SHALL EXAMINE ALL OPENINGS IN DETAIL TO DETERMINE ALL THE REQUIREMENTS. THE HARDWARE SET NUMBERS WILL BE FOUND IN AN APPROPRIATE COLUMN OF THE DOOR SCHEDULE.**

### 4.02 HARDWARE GROUP #01.0 - GLASS AND ALUMINUM ENTRANCE

| | |
|---|---|
| Cylinder Housing 80-103 X 138 626 | 1 |
| Construction Core - Green 80-035 | 1 |

### 4.03 HARDWARE GROUP #02.0 - GLASS AND ALUMINUM INTERIOR - ARCHERY, WORKSHOP, GOLF SERVICES

| | |
|---|---|
| Cylinder Housing 80-103 X 138 626 | 1 |
| Construction Core - Green 80-035 | 1 |

### 4.04 HARDWARE GROUP #03.0 - EXTERIOR FROM SALES FLOOR

| | |
|---|---|
| 3070 EXTERIOR HOLLOW METAL DOOR | 1 |
| 3070 EXTERIOR HOLLOW METAL FRAME | 1 |
| Exterior Hinge TA2714 4 ½ x 4 ½ 26D | 3 |
| Yale Egress Exit Device 7150 A K625 x CT7SD 630 | 1 |
| Construction Core - Green 80-035 | 1 |
| Closer 3521 689 | 1 |
| Threshold 896V X 36" MILL | 1 |
| Door Sweep D608A X 36" | 1 |
| Gasketing 5050B x 17' | 1 |
| Drip Cap 16A X 40" | 1 |

### 4.05 HARDWARE GROUP #03.0.EX - EXISTING EXTERIOR FROM SALES FLOOR

| | |
|---|---|
| Yale Egress Exit Device 7150 A K625 x CT7SD 630 | 1 |
| Construction Core - Green 80-035 | 1 |
| Closer 3521 689 | 1 |

### 4.06 HARDWARE GROUP #03.0.INT - SALES FLOOR FROM EXIT CORRIDOR FIRE RATED

| | |
|---|---|
| 3070 INTERIOR HOLLOW METAL DOOR RATED | 1 |
| 3070 INTERIOR HOLLOW METAL FRAME RATED | 1 |
| Interior Hinge TA2714 4 1/2 X 4 1/2 26D | 3 |
| Yale Alarm Egress Exit Device 7150F A K625 X CT7SD SN-134 630 | 1 |
| Exit Device Trim AU-626F 630 | 1 |
| Rim Cylinder Housing K680 1 3/8” 626 | 1 |
| Blocking Ring 36-082 X 025 626 | 1 |
| Construction Core - Green 80-035 | 2 |

| | |
|---|---|
| Closer 3501 689 | 1 |
| Floor Stop 242F US26D | 1 |
| Door Silencer 307D Grey | 3 |
| Gasketing 5050B x 17' | 1 |
| Door Sweep D608A X 36" | 1 |

### 4.07 HARDWARE GROUP #03.0.WS - EXTERIOR FROM SALES FLOOR (WIND-STORM RATED-FLORIDA PRODUCT APPROVAL)

| | |
|---|---|
| 3070 EXTERIOR HOLLOW METAL DOOR WINDSTORM RATED | 1 |
| 3070 EXTERIOR HOLLOW METAL FRAME WINDSTORM RATED | 1 |
| Exterior Hinge BB1279 4 1/2 X 4 1/2 NRP 26D | 3 |
| Yale Egress Exit Device 7150WS A K625 x CT7SD SN-134 630 | 1 |
| Construction Core - Green 80-035 | 1 |
| Closer 3521 689 | 1 |
| Threshold 2005 AV 36" Tapcon Screws (3) | 1 |
| Door Sweep D608A X 36" | 1 |
| Gasketing S88 BL x 17' | 1 |
| Drip Cap 16A X 40” | 1 |

### 4.08 HARDWARE GROUP #03.1 - EXTERIOR FROM CORRIDOR EXIT OR SALES FLOOR

| | |
|---|---|
| 4070 EXTERIOR HOLLOW METAL DOOR | 1 |
| 4070 EXTERIOR HOLLOW METAL FRAME | 1 |
| Exterior Hinge TA2314 4 1/2 X 4 1/2 NRP 26D | 3 |
| Yale Alarm Egress Exit Device 7150 A K625 X CT7SD 630 48" | 1 |
| Construction Core - Green 80-035 | 1 |
| Closer 3521 689 | 1 |
| Threshold 896V X 48" MILL | 1 |
| Door Sweep D608A X 48" | 1 |
| Gasketing 5050B x 20' | 1 |
| Drip Cap 16A X 52" | 1 |

### 4.09 HARDWARE GROUP #03.1.INT - SALES FLOOR TO EXIT CORRIDOR FIRE RATED

| | |
|---|---|
| 4070 INTERIOR HOLLOW METAL DOOR RATED | 1 |
| 4070 INTERIOR HOLLOW METAL FRAME RATED | 1 |
| Interior Hvy Wt Hinge BB1168 4 1/2 X 4 1/2 26D | 3 |
| Yale Alarm Egress Exit Device 7150F A K625 X CT7SD SN-134 630 48"” | 1 |
| Exit Device Trim AU-626F 630 | 1 |
| Rim Cylinder Housing K680 X 1 3/8” 626 | 1 |
| Blocking Ring 36-082 X 025 626 | 1 |
| Construction Core - Green 80-035 | 2 |
| Closer 3501 689 | 1 |
| Floor Stop 242F US26D | 1 |
| Door Silencer 307D Grey | 1 |
| Gasketing 5050B x 20' | 1 |
| Door Sweep D608A X 48" | 1 |

### 4.10 HARDWARE GROUP #03.1.WS - EXTERIOR FROM SALES FLOOR (WIND-STORM RATED-FLORIDA PRODUCT APPROVAL)

| | |
|---|---|
| 4070 EXTERIOR HOLLOW METAL DOOR WINDSTORM RATED | 1 |
| 4070 EXTERIOR HOLLOW METAL FRAME WINDSTORM RATED | 1 |
| Exterior Hinge BB1279 4 1/2 X 4 1/2 NRP 26D | 3 |
| Yale Alarm Egress Exit Device 7150WS A K625 X CT7SD SN-134 630 48" | 1 |
| Construction Core - Green 80-035 | 1 |
| Closer 3521 689 | 1 |
| Threshold 2005 AV 48" Tapcon Screws (4) | 1 |
| Door Sweep D608A X 48" | 1 |
| Gasketing S88 BL x 20' | 1 |
| Drip Cap 16A X 52” | 1 |

### 4.11 HARDWARE GROUP #03.2 - EXTERIOR PAIR FROM SALES

| | |
|---|---|
| 3070 EXTERIOR HOLLOW METAL DOOR | 2 |
| 6070 EXTERIOR HOLLOW METAL FRAME | 1 |
| Exterior Hinge TA2314 4 1/2 X 4 1/2 NRP 26D | 6 |
| Yale Egress Exit Device 7150 A K625 x CT7SD 630 | 2 |
| Keyed Mullion KRM200F X 7’ X 600 | 1 |
| Mortise Cylinder Housing K660 X 1 3/8" 626 | 1 |
| Construction Core - Green 80-035 | 3 |
| Blocking Ring 36-079 X 050 626 | 1 |
| Closer 3521 689 | 2 |
| Threshold 896V X 72" MILL | 1 |
| Door Sweep D608A X 36" | 2 |
| Gasketing 5050B x 17' | 2 |
| Drip Cap 16A X 76" | 1 |

### 4.12 HARDWARE GROUP #03.2.INT - SALES FLOOR PAIR TO EXIT CORRIDOR FIRE RATED

| | |
|---|---|
| 3070 INTERIOR HOLLOW METAL DOOR RATED | 2 |
| 6070 INTERIOR HOLLOW METAL FRAME RATED | 1 |
| Interior Hinge TA2714 4 1/2 X 4 1/2 26D | 6 |
| Keyed Mullion KRM200F X 7’ X 600 | 1 |
| Yale Alarm Egress Exit Device 7150F A K625 X CT7SD SN-134 630 | 2 |
| Mortise Cylinder Housing K660 X 1 3/8" 626 | 1 |
| Blocking Ring 36-079 X 050 626 | 1 |
| Exit Device Trim AU-626F 630 | 1 |
| Rim Cylinder Housing K680 1 3/8” 626 | 1 |
| Blocking Ring 36-082 X 025 626 | 1 |
| Construction Core - Green 80-035 | 4 |
| Closer 3501 689 | 2 |
| Floor Stop 242F US26D | 2 |
| Door Silencer 307D Grey | 2 |
| Gasketing 5050B x 17' | 2 |

| | |
|---|---|
| Door Sweep D608A X 36" | 2 |

### 4.13 HARDWARE GROUP #03.2.WS - EXTERIOR PAIR FROM SALES FLOOR (WIND-STORM RATED-FLORIDA PRODUCT APPROVAL)

| | |
|---|---|
| 3070 EXTERIOR HOLLOW METAL DOOR WINDSTORM RATED | 2 |
| 6070 EXTERIOR HOLLOW METAL FRAME WINDSTORM RATED | 1 |
| Exterior Hinge BB1279 4 1/2 X 4 1/2 NRP 26D | 6 |
| Keyed Mullion KRM200F X 7’ X 600 | 1 |
| Yale Egress Exit Device 7150WS A K625 x CT7SD SN-134 630 | 2 |
| Blocking Ring 36-079 X 050 626 | 1 |
| Mortise Cylinder Housing K660 X 1 3/8" 626 | 1 |
| Construction Core - Green 80-035 | 3 |
| Closer 3521 689 | 2 |
| Threshold 2005 AV 72" Tapcon Screws (4) | 1 |
| Door Sweep D608A X 36" | 2 |
| Gasketing S88 BL x 17' | 2 |
| Drip Cap 16A X 76” | 1 |

### 4.14 HARDWARE GROUP #03.3.3070 - SALES OR RECEIVING FROM STAIRWELL (FIRE RATED)

| | |
|---|---|
| 3070 INTERIOR HOLLOW METAL DOOR RATED | 1 |
| 3070 INTERIOR HOLLOW METAL FRAME RATED | 1 |
| Interior Hvy Wt Hinge BB1168 4 1/2 X 4 1/2 26D | 3 |
| Yale Alarm Egress Exit Device 7150F A K625 X CT7SD SN-134 630 | 1 |
| Exit Device Trim AU-626F 630 | 1 |
| Rim Cylinder Housing K680 1 3/8” 626 | 1 |
| Blocking Ring 36-082 X 025 626 | 1 |
| Construction Core - Green 80-035 | 2 |
| Closer 3501 689 | 1 |
| Floor Stop 242F US26D | 1 |
| Door Silencer 307D Grey | 3 |
| Gasketing 5050B x 17' | 1 |
| Door Sweep D608A X 36" | 1 |

### 4.15 HARDWARE GROUP #03.3.3670 - SALES OR RECEIVING FROM STAIRWELL (FIRE RATED)

| | |
|---|---|
| 3670 INTERIOR HOLLOW METAL DOOR RATED | 1 |
| 3670 INTERIOR HOLLOW METAL FRAME RATED | 1 |
| Interior Hvy Wt Hinge BB1168 4 1/2 X 4 1/2 26D | 3 |
| Yale Alarm Egress Exit Device 7150F A K625 X CT7SD SN-134 630 | 1 |
| Exit Device Trim AU-626F 630 | 1 |
| Rim Cylinder Housing K680 1 3/8” 626 | 1 |
| Blocking Ring 36-082 X 025 626 | 1 |
| Construction Core - Green 80-035 | 2 |
| Closer 3501 689 | 1 |
| Floor Stop 242F US26D | 1 |
| Door Silencer 307D Grey | 3 |

| | |
|---|---|
| Gasketing 5050B x 20' | 1 |
| Door Sweep D608A X 42" | 1 |

### 4.16 HARDWARE GROUP #03.3.3870 - SALES OR RECEIVING FROM STAIRWELL (FIRE RATED)

| | |
|---|---|
| 3870 INTERIOR HOLLOW METAL DOOR RATED | 1 |
| 3870 INTERIOR HOLLOW METAL FRAME RATED | 1 |
| Interior Hvy Wt Hinge BB1168 4 1/2 X 4 1/2 26D | 3 |
| Yale Alarm Egress Exit Device 7150F A K625 X CT7SD SN-134 630 48" | 1 |
| Exit Device Trim AU-626F 630 | 1 |
| Rim Cylinder Housing K680 1 3/8” 626 | 1 |
| Blocking Ring 36-082 X 025 626 | 1 |
| Construction Core - Green 80-035 | 2 |
| Closer 3501 689 | 1 |
| Floor Stop 242F US26D | 1 |
| Door Silencer 307D Grey | 3 |
| Gasketing 5050B x 20' | 1 |
| Door Sweep D608A X 44" | 1 |

### 4.17 HARDWARE GROUP #03.9 - EXTERIOR FROM SALES FLOOR (WHEN WITHIN 40 FEET OF GUNS)

| | |
|---|---|
| 3070 EXTERIOR HOLLOW METAL DOOR | 1 |
| 3070 EXTERIOR HOLLOW METAL FRAME | 1 |
| Exterior Hinge TA2314 4 1/2 X 4 1/2 NRP 26D | 3 |
| Delayed Exit Device 3-Point Locking TEL-DES 36” | 1 |
| Mortise Cylinder Housing K660 X 1 3/8” 626 | 1 |
| Construction Core - Green 80-035 | 1 |
| Astragal 835S X 84” -Mil - Flat Bar Astragal (cut to fit above/below latch protector) | 1 |
| Closer 3521 689 | 1 |
| Threshold 896V X 36" MILL | 1 |
| Door Sweep D608A X 36" | 1 |
| Gasketing 5050B x 17' | 1 |
| Drip Cap 16A X 40" | 1 |

### 4.18 HARDWARE GROUP #03.9.1 - EXTERIOR FROM SALES FLOOR (WHEN WITHIN 40 FEET OF GUNS)

| | |
|---|---|
| 4070 EXTERIOR HOLLOW METAL DOOR | 1 |
| 4070 EXTERIOR HOLLOW METAL FRAME | 1 |
| Exterior Hinge TA2314 4 1/2 X 4 1/2 NRP 26D | 3 |
| Delayed Exit Device 3-Point Locking TEL-DES 48” | 1 |
| Paddle for 4-Foot Door Tel-EP1 - 24” (when 4’ door is used) | 1 |
| Mortise Cylinder Housing K660 X 1 3/8” 626 | 1 |
| Construction Core - Green 80-035 | 1 |
| Astragal 835S X 84”-Mil-Flat Bar Astragal (cut to fit above/below latch protector) | 1 |
| Closer 3521 689 | 1 |
| Threshold 896V X 48” MILL | 1 |
| Door Sweep D608A X 48” | 1 |

| | |
|---|---|
| Gasketing 5050B x 20' | 1 |
| Drip Cap 16A X 52” | 1 |

### 4.19 HARDWARE GROUP #03.9.2 - EXTERIOR PAIR FROM SALES FLOOR (WHEN WITHIN 40 FEET OF GUNS)

| | |
|---|---|
| 3070 EXTERIOR HOLLOW METAL DOOR | 2 |
| 6070 EXTERIOR HOLLOW METAL FRAME | 1 |
| Exterior Hinge TA2314 4 1/2 X 4 1/2 NRP 26D | 6 |
| Keyed Mullion KRM200F 84" 600 K660 7-Pin | 1 |
| Mortise Cylinder Housing K660 X 1 3/8” 626 | 3 |
| Blocking Ring 36-079 X 050 626 | 1 |
| Delayed exit Device 3-Point Locking TEL-DES | 2 |
| Construction Core - Green 80-035 | 3 |
| Closer 3521 689 | 2 |
| Threshold 896V X 72” MILL | 1 |
| Door Sweep D608A X 36" | 2 |
| Gasketing 5050B x 17’ | 2 |
| Drip Cap 16A X 76” | 1 |

### 4.20 HARDWARE GROUP #04.0 - NON-SECURE STOCK OR NON-SECURE PASSAGE

| | |
|---|---|
| 3070 INTERIOR HOLLOW METAL DOOR | 1 |
| 3070 INTERIOR HOLLOW METAL FRAME | 1 |
| Interior Hinge TA2714 4 1/2 X 4 1/2 26D | 3 |
| Passage Set AU 5401LN 626 | 1 |
| Closer 3501 689 | 1 |
| Floor Stop 242F US26D | 1 |
| Door Silencer 307D Grey | 3 |

### 4.21 HARDWARE GROUP #04.1 - FOOTWEAR TO STOCKROOM

| | |
|---|---|
| 3070 INTERIOR HOLLOW METAL DOOR | 1 |
| 3070 INTERIOR HOLLOW METAL FRAME | 1 |
| Interior Hinge TA2714 4 1/2 X 4 1/2 26D | 3 |
| Push Plate 30S 4 X 16 US32D | 1 |
| Door Pull H 31E 4 X 16 US 32D | 1 |
| Closer 3501 689 | 1 |
| Floor Stop 242F US26D | 1 |
| Protection Plate 190S 8" X 34" US32D | 1 |
| Door Silencer 307D Grey | 3 |

### 4.22 HARDWARE GROUP #04.2 - FOOTWEAR NON-RATED NON-SECURE STOCK OR NON-SECURE PASSAGE

| | |
|---|---|
| 3070 INTERIOR HOLLOW METAL DOOR | 1 |
| 3070 INTERIOR HOLLOW METAL FRAME | 1 |
| Interior Hinge TA2714 4 1/2 X 4 1/2 26D | 3 |
| Passage Set AU 5401LN 626 | 1 |
| Closer 3501 689 | 1 |

| | |
|---|---|
| Floor Stop 242F US26D | 1 |
| Protection Plate 190S 8" X 34" US32D | 1 |
| Door Silencer 307D Grey | 3 |

### 4.23 HARDWARE GROUP #04.3 - FOOTWEAR FIRE RATED NON-SECURE STOCK OR NON-SECURE PASSAGE

| | |
|---|---|
| 3070 INTERIOR HOLLOW METAL DOOR RATED | 1 |
| 3070 INTERIOR HOLLOW METAL FRAME RATED | 1 |
| Interior Hinge TA2714 4 1/2 X 4 1/2 26D | 3 |
| Passage Set AU 5401LN 626 | 1 |
| Closer 3501 689 | 1 |
| Floor Stop 242F US26D | 1 |
| Protection Plate 190S 8" X 34" US32D | 1 |
| Door Sweep D608A X 36" | 1 |
| Gasketing 5050B X 17' | 1 |
| Door Silencer 307D Grey | 3 |

### 4.24 HARDWARE GROUP #04.4 – FOOTWEAR FIRE RATED PASSAGE WITH MAG HOLDER

| | |
|---|---|
| 3070 INTERIOR HOLLOW METAL DOOR RATED | 1 |
| 3070 INTERIOR HOLLOW METAL FRAME RATED | 1 |
| Interior Hinge TA2714 4 1/2 X 4 1/2 26D | 3 |
| Passage Set AU 5401LN 626 | 1 |
| Electromagnetic Holder 998 689 | 1 |
| Closer 3501 689 | 1 |
| Floor Stop 242F US26D | 1 |
| Protection Plate 190S 8" X 34" US32D | 1 |
| Door Sweep D608A X 36" | 1 |
| Gasketing 5050B X 17' | 1 |
| Door Silencer 307D Grey | 3 |

### 4.25 HARDWARE GROUP #04.5 – FOOTWEAR FIRE RATED PASSAGE WITH SENTRONIC CLOSER

| | |
|---|---|
| 3070 INTERIOR HOLLOW METAL DOOR RATED | 1 |
| 3070 INTERIOR HOLLOW METAL FRAME RATED | 1 |
| Interior Hinge TA2714 4 1/2 X 4 1/2 26D | 3 |
| Passage Set AU 5401LN 626 | 1 |
| Closer Electronically Controlled 4040SE X 120V | 1 |
| Floor Stop 242F US26D | 1 |
| Protection Plate 190S 8" X 34" US32D | 1 |
| Door Sweep D608A X 36" | 1 |
| Gasketing 5050B X 17' | 1 |
| Door Silencer 307D Grey | 3 |

### 4.26 HARDWARE GROUP #04.9 - FIRE-RATED STOCKROOM TO IMPACT DOOR CORRIDOR (OPEN UP TO 90 DEGREES)

| | |
|---|---|
| 3090 INTERIOR HOLLOW METAL DOOR RATED | 2 |
| 6090 INTERIOR HOLLOW METAL FRAME RATED | 1 |
| Interior Hinge TA2714 4 1/2 X 4 1/2 26D | 8 |
| Surface Vertical Rod 7170F90-LBR-36-9 X EO 630 | 2 |
| Passage Trim AU-628F | 2 |
| Closer Electronically Controlled 4040SE X 120V | 2 |
| Protection Plate 190S 8" X 34" US32D | 2 |
| Door Silencer 307D Grey | 2 |
| Gasketing 5050B x 25' | 1 |
| Door Sweep D608A X 36" | 2 |
| Astragal 160V 108" | 2 |

### 4.27 HARDWARE GROUP #04.99 - FIRE-RATED STOCKROOM TO IMPACT DOOR CORRIDOR (OPEN UP TO 180 DEGREES)

| | |
|---|---|
| 3090 INTERIOR HOLLOW METAL DOOR RATED | 2 |
| 6090 INTERIOR HOLLOW METAL FRAME RATED | 1 |
| Interior Hinge TA2714 4 1/2 X 4 1/2 26D | 8 |
| Surface Vertical Rod 7170F90-LBR-36-9 X EO 630 | 2 |
| Passage Trim AU-628F | 2 |
| Closer 3501 689 | 2 |
| Protection Plate 190S 8" X 34" US32D | 2 |
| Electromagnetic Holder 998 689 | 2 |
| Door Silencer 307D Grey | 2 |
| Gasketing 5050B x 25' | 1 |
| Door Sweep D608A X 36" | 2 |
| Astragal 160V 108" | 2 |

### 4.28 HARDWARE GROUP #05.0 - RESTROOM WITH STALLS

| | |
|---|---|
| 3070 INTERIOR HOLLOW METAL DOOR WITH 1” UNDERCUT | 1 |
| 3070 INTERIOR HOLLOW METAL FRAME | 1 |
| Interior Hinge TA2714 4 1/2 X 4 1/2 26D | 3 |
| Push Plate 30S 4 X 16 US32D | 1 |
| Door Pull H 31E 4 X 16 US 32D | 1 |
| Closer 3501 689 | 1 |
| Floor Stop 242F US26D | 1 |
| Protection Plate 190S 8" X 34" US32D | 2 |
| Door Silencer 307D Grey | 3 |

### 4.29 HARDWARE GROUP #05.1 - SINGLE RESTROOM

| | |
|---|---|
| 3070 INTERIOR HOLLOW METAL DOOR WITH 1” UNDERCUT | 1 |
| 3070 INTERIOR HOLLOW METAL FRAME | 1 |
| Interior Hinge TA2714 4 1/2 X 4 1/2 26D | 3 |
| Privacy Set AU-5402LN X 693 X 497 626 | 1 |

| | |
|---|---|
| Closer 3501 689 | 1 |
| Floor Stop 242F US26D | 1 |
| Protection Plate 190S 8" X 34" US32D | 2 |
| Door Silencer 307D Grey | 3 |

### 4.30 HARDWARE GROUP #06.0 - OFFICES WITH PUSH BUTTON (LOCKED IF PUSHED IN)

| | |
|---|---|
| 3070 INTERIOR HOLLOW METAL DOOR | 1 |
| 3070 INTERIOR HOLLOW METAL FRAME | 1 |
| Interior Hinge TA2714 4 1/2 X 4 1/2 26D | 3 |
| Lockset B AU 5407LN 626 | 1 |
| Construction Core - Green 80-035 | 1 |
| Closer 3501 689 | 1 |
| Floor Stop 242F US26D | 1 |
| Door Silencer 307D Grey | 3 |

### 4.31 HARDWARE GROUP #09.0 - SECURED STOCK/STORAGE/AV-DATA/DISPLAY NO PUSH BUTTON (ALWAYS LOCKED)

| | |
|---|---|
| 3070 INTERIOR HOLLOW METAL DOOR | 1 |
| 3070 INTERIOR HOLLOW METAL FRAME | 1 |
| Interior Hinge TA2714 4 1/2 X 4 1/2 26D (add extra hinge if door is 8’ tall) | 3 |
| Lockset B AU 5405LN 626 | 1 |
| Construction Core - Green 80-035 | 1 |
| Closer 3501 689 | 1 |
| Floor Stop 242F US26D | 1 |
| Door Silencer 307D Grey | 3 |

### 4.32 HARDWARE GROUP #09.0.8 - STORAGE ROOM 2ND FLOOR TLP NO PUSH BUTTON (ALWAYS LOCKED)

| | |
|---|---|
| 3080 INTERIOR HOLLOW METAL DOOR | 1 |
| 3080 INTERIOR HOLLOW METAL FRAME | 1 |
| Interior Hinge TA2714 4 1/2 X 4 1/2 26D | 4 |
| Lockset B AU 5405LN 626 | 1 |
| Construction Core - Green 80-035 | 1 |
| Closer 3501 689 | 1 |
| Floor Stop 242F US26D | 1 |
| Door Silencer 307D Grey | 3 |

### 4.33 HARDWARE GROUP #09.0.SIM - SECURED STOCK/STORAGE/AV-DATA/DISPLAY NO PUSH BUTTON (ALWAYS LOCKED) (SIM IS USED WHEN OPENING SIZE IS DIFFERENT THAN ORIGINAL 3070 HARDWARE SET #09.0)

| | |
|---|---|
| 2070 INTERIOR HOLLOW METAL DOOR | 1 |
| 2070 INTERIOR HOLLOW METAL FRAME | 1 |
| Interior Hinge TA2714 4 1/2 X 4 1/2 26D (add extra hinge if door is 8’ tall) | 3 |
| Lockset B AU 5405LN 626 | 1 |
| Construction Core - Green 80-035 | 1 |

| | |
|---|---|
| Closer 3501 689 | 1 |
| Floor Stop 242F US26D | 1 |
| Door Silencer 307D Grey | 3 |

### 4.34 HARDWARE GROUP #09.1 - CASH OR COUNT WITH DOOR SCOPES

| | |
|---|---|
| 3070 INTERIOR HOLLOW METAL DOOR | 1 |
| 3070 INTERIOR HOLLOW METAL FRAME | 1 |
| Interior Hinge TA2714 4 1/2 X 4 1/2 26D | 3 |
| Lockset B AU 5405LN 626 | 1 |
| Construction Core - Green 80-035 | 1 |
| Closer 3501 689 | 1 |
| Floor Stop 242 242F US26D | 1 |
| Door Silencer 307D Grey | 3 |
| Door Scope DS1000 [Mount (1) at 60” AFF and (1) at 42”] | 2 |

### 4.35 HARDWARE GROUP #09.2 - SECURED STOCK/STORAGE PAIR NO PUSH BUTTON (ALWAYS LOCKED) ACTIVE/FLUSH BOLTS ON INACTIVE

| | |
|---|---|
| 3070 INTERIOR HOLLOW METAL DOOR | 2 |
| 6070 INTERIOR HOLLOW METAL FRAME | 1 |
| Interior Hinge TA2714 4 1/2 X 4 1/2 26D | 6 |
| Lockset B AU 5405LN 626 | 1 |
| Construction Core - Green 80-035 | 1 |
| Flush Bolt 282D 12" US26D | 2 |
| Dustproof Strike 280X | 1 |
| Closer 3501 689 | 2 |
| Flat Bar Astragal 835S X 84” USP (on active door) | 1 |
| Floor Stop 242F US26D | 2 |
| Door Silencer 307D Grey | 2 |

### 4.36 HARDWARE GROUP #09.3 – RATED SECURED STOCK/STORAGE/AV-DATA/DISPLAY NO PUSH BUTTON (ALWAYS LOCKED)

| | |
|---|---|
| 3070 INTERIOR HOLLOW METAL DOOR RATED | 1 |
| 3070 INTERIOR HOLLOW METAL FRAME RATED | 1 |
| Interior Hinge TA2714 4 1/2 X 4 1/2 26D | 3 |
| Lockset B AU 5405LN 626 | 1 |
| Construction Core - Green 80-035 | 1 |
| Closer 3501 689 | 1 |
| Floor Stop 242F US26D | 1 |
| Gasketing 5050B x 17'' | 1 |
| Door Sweep D608A X 36” | 1 |
| Door Silencer 307D Grey | 3 |

### 4.37 HARDWARE GROUP #09.4 - SECURED ROOM EXTERIOR

| | |
|---|---|
| 3070 EXTERIOR HOLLOW METAL DOOR | 1 |
| 3070 EXTERIOR HOLLOW METAL FRAME | 1 |

| | |
|---|---|
| Exterior Hinge TA2314 4 1/2 X 4 1/2 NRP 26D | 3 |
| Lockset B AU 5405LN 626 | 1 |
| Construction Core - Green 80-035 | 1 |
| Closer 3521 689 | 1 |
| Threshold 896V X 36" MILL | 1 |
| Door Sweep D608A X 36" | 1 |
| Gasketing 5050B x 17' | 1 |
| Drip Cap 16A X 40" | 1 |

### 4.38 HARDWARE GROUP #09.4.WS - EXTERIOR ROOM (WIND-STORM RATED- FLORIDA PRODUCT APPROVAL)

| | |
|---|---|
| 3070 EXTERIOR HOLLOW METAL DOOR WINDSTORM RATED | 1 |
| 3070 EXTERIOR HOLLOW METAL FRAME WINDSTORM RATED | 1 |
| Exterior Hinge BB1279 4 1/2 X 4 1/2 NRP 26D | 3 |
| Lockset B AU 5405LN 626 | 1 |
| Construction Core - Green 80-035 | 1 |
| Closer 3521 689 | 1 |
| Door Sweep D608A X 36" | 1 |
| Drip Cap 16A X 40" | 1 |
| Gasketing S88 BL x 17' | 1 |
| Threshold 2005 AV 36" Tapcon Screws (3) | 1 |

### 4.39 HARDWARE GROUP #10.0 - RECEIVING AT DOCK (WHEN NO BALER DOOR PAIR IS PRESENT)

| | |
|---|---|
| 3070 EXTERIOR HOLLOW METAL DOOR | 1 |
| 3070 EXTERIOR HOLLOW METAL FRAME | 1 |
| Exterior Hinge TA2314 4 1/2 X 4 1/2 NRP 26D | 3 |
| Yale Egress Exit Device 7150 A K625 X CT7SD 630 | 1 |
| Construction Core - Green 80-035 | 1 |
| Closer 3521T 689 | 1 |
| Protection Plate 190S 8” x 34” US32D | 1 |
| Handicap Threshold 413 X 36” AL | 1 |
| Door Sweep D608A X 36" | 1 |
| Gasketing 5050B x 17' | 1 |
| Drip Cap 16A X 40" | 1 |
| Door Scope DS1000 [Mount (1) at 60” AFF and (1) at 43” AFF TO BOTTOM] **(Receiving Doors ONLY)** | 2 |

### 4.40 HARDWARE GROUP #10.0TRIM - RECEIVING AT DOCK (WHEN NO BALER DOOR PAIR IS PRESENT)

| | |
|---|---|
| 3070 EXTERIOR HOLLOW METAL DOOR | 1 |
| 3070 EXTERIOR HOLLOW METAL FRAME | 1 |
| Exterior Hinge TA2314 4 1/2 X 4 1/2 NRP 26D | 3 |
| Yale Egress Exit Device 7150 A 630 | 1 |
| Exit Device Trim Storeroom AU626-F 630 | 1 |
| Blocking Ring 36-082 X 025 626 | 1 |

| | |
|---|---|
| Rim Cylinder Housing K680 x 1 3/8” 626 | 1 |
| Construction Core - Green 80-035 | 2 |
| Closer 3521T 689 | 1 |
| Protection Plate 190S 8” x 34” US32D | 1 |
| Handicap Threshold 413 X 36” AL | 1 |
| Door Sweep D608A X 36" | 1 |
| Gasketing 5050B x 17' | 1 |
| Drip Cap 16A X 40" | 1 |
| Door Scope DS1000 [Mount (1) at 60” AFF and (1) at 43” AFF TO BOTTOM] **(Receiving Doors ONLY)** | 2 |

### 4.41 HARDWARE GROUP #10.0.WS - RECEIVING AND STOCKROOM EXITS (WIND-RATED-FLORIDA PRODUCT APPROVAL)

| | |
|---|---|
| 3070 EXTERIOR HOLLOW METAL DOOR WINDSTORM RATED | 1 |
| 3070 EXTERIOR HOLLOW METAL FRAME WINDSTORM RATED | 1 |
| Exterior Hinge BB1279 4 1/2 X 4 1/2 NRP 26D | 3 |
| Yale Egress Exit Device 7150WS A K625 x CT7SD SN-134 630 | 1 |
| Construction Core - Green 80-035 | 1 |
| Closer 3521T 689 | 1 |
| Protection Plate 190S 8” x 34” US32D | 1 |
| Threshold 2005 AV 36" Tapcon Screws (3) | 1 |
| Gasketing S88 BL x 17' | |
| Door Sweep D608A X 36" | 1 |
| Drip Cap 16A X 40" | 1 |
| Viewer 1755 US26D [Mount (1) at 60” AFF and (1) at 43” AFF TO BOTTOM] **(Receiving Doors ONLY)** | 2 |

### 4.42 HARDWARE GROUP #10.1 - RECEIVING AT DOCK

| | |
|---|---|
| 4070 EXTERIOR HOLLOW METAL DOOR | 1 |
| 4070 EXTERIOR HOLLOW METAL FRAME | 1 |
| Exterior Hinge TA2314 4 1/2 X 4 1/2 NRP 26D | 3 |
| Yale Egress Exit Device 7150 A K625 x CT7SD 630 48” | 1 |
| Construction Core - Green 80-035 | 1 |
| Closer 3521T 689 | 1 |
| Protection Plate 190S 10” x 46” US32D | 1 |
| Handicap Threshold 413 X 48” AL | 1 |
| Door Sweep D608A X 48" | 1 |
| Gasketing 5050B x 20' | 1 |
| Drip Cap 16A X 52" | 1 |
| Door Scope DS1000 [Mount (1) at 60” AFF and (1) at 43” AFF TO BOTTOM] **(Receiving Doors ONLY)** | 2 |

### 4.43 HARDWARE GROUP #10.1TRIM - RECEIVING AT DOCK

| | |
|---|---|
| 4070 EXTERIOR HOLLOW METAL DOOR | 1 |
| 4070 EXTERIOR HOLLOW METAL FRAME | 1 |
| Exterior Hinge TA2314 4 1/2 X 4 1/2 NRP 26D | 3 |

| | |
|---|---|
| Yale Egress Exit Device 7150 A K625 x CT7SD 630 48” | 1 |
| Exit Device Trim Storeroom AU626-F 630 | 1 |
| Rim Cylinder Housing K680 x 1 3/8” 626 | 1 |
| Blocking Ring 36-082 x 025 626 | 1 |
| Construction Core - Green 80-035 | 2 |
| Closer 3521T 689 | 1 |
| Protection Plate 190S 10” x 46” US32D | 1 |
| Handicap Threshold 413 X 48” AL | 1 |
| Door Sweep D608A X 48" | 1 |
| Gasketing 5050B x 20' | 1 |
| Drip Cap 16A X 52" | 1 |
| Door Scope DS1000 [Mount (1) at 60” AFF and (1) at 43” AFF TO BOTTOM] **(Receiving Doors ONLY)** | 2 |

### 4.44 HARDWARE GROUP #10.1WS - RECEIVING AT DOCK WIND STORM

| | |
|---|---|
| 4070 EXTERIOR HOLLOW METAL DOOR | 1 |
| 4070 EXTERIOR HOLLOW METAL FRAME | 1 |
| Exterior Hinge BB1279 4 1/2 X 4 1/2 NRP 26D | 3 |
| Yale Egress Exit Device 7150 A K625 x CT7SD SN-134 630 48” | 1 |
| Construction Core - Green 80-035 | 1 |
| Closer 3521T 689 | 1 |
| Protection Plate 190S 10” x 46” US32D | 1 |
| Threshold 2005 AV 48" Tapcon Screws (4) | 1 |
| Door Sweep D608A X 48" | 1 |
| Gasketing S88 BL x 20’ | 1 |
| Drip Cap 16A X 52" | 1 |
| Door Viewer 1755 [Mount (1) at 60” AFF and (1) at 43” AFF TO BOTTOM] **(Receiving Doors ONLY)** | 2 |

### 4.45 HARDWARE GROUP #10.3 - PAIR AT RECEIVING (NON-WINDSTORM AREAS-W/34” MAX USEABLE EGRESS @ ACTIVE DOOR ONLY)

| | |
|---|---|
| 3070 EXTERIOR HOLLOW METAL DOOR W/ ASTRAGAL | 1 |
| 3070 EXTERIOR HOLLOW METAL DOOR W/ MORTISE PREP & ASTRAGAL | 1 |
| 6070 EXTERIOR HOLLOW METAL FRAME W/ FB PREP | 1 |
| Exterior Hinge TA2314 4 1/2 X 4 1/2 NRP 26D | 6 |
| Mortise Egress Exit Device 7130 K5 712 X 630 | 1 |
| Flush Bolt 282D 12” US26D | 2 |
| 945T Contact | 2 |
| Exit Alarm EAX-500 | 1 |
| Dustproof Strike 280X | 1 |
| Mortise Cylinder Housing 80-102 X 138 626 | 1 |
| Construction Core - Green 80-035 | 1 |
| Closer 3521T 689 | 2 |
| Protection Plate 190S 8" X 34" US32D | 2 |
| Threshold Handicap 413 X 72" AL | 1 |
| Door Sweep D608A X 36" | 2 |

| | |
|---|---|
| Gasketing 5050B x 20' | 1 |
| Drip Cap 16A X 76" | 1 |
| Door Scope DS1000 [Mount (1) at 60” AFF and (1) at 42” AFF TO BOTTOM] **(INACTIVE DOOR ONLY)** | 2 |

### 4.46 HARDWARE GROUP #10.3TRIM - PAIR AT RECEIVING (NON-WINDSTORM AREAS-W/34” MAX USEABLE EGRESS @ ACTIVE DOOR ONLY)

| | |
|---|---|
| 3070 EXTERIOR HOLLOW METAL DOOR W/ ASTRAGAL | 1 |
| 3070 EXTERIOR HOLLOW METAL DOOR W/ MORTISE PREP & ASTRAGAL | 1 |
| 6070 EXTERIOR HOLLOW METAL FRAME W/ FB PREP | 1 |
| Exterior Hinge TA2314 4 1/2 X 4 1/2 NRP 26D | 6 |
| Mortise Egress Exit Device 7130 K5 712 X 630 | 1 |
| Exit Device Trim Storeroom AU626-F 630 | 1 |
| Rim Cylinder Housing K680 X 1 3/8” 626 | 1 |
| Blocking Ring 36-082 X 025 626 | 1 |
| Construction Core - Green 80-035 | 2 |
| Flush Bolt 282D 12” US26D | 2 |
| Exit Alarm EAX-500 | 1 |
| Contact 945T | 2 |
| Dustproof Strike 280X | 1 |
| Mortise Cylinder Housing 80-102 X 138 626 | 1 |
| Closer 3521T 689 | 2 |
| Protection Plate 190S 8" X 34" US32D | 2 |
| Threshold Handicap 413 X 72" AL | 1 |
| Door Sweep D608A X 36" | 2 |
| Gasketing 5050B x 20' | 1 |
| Drip Cap 16A X 76" | 1 |
| Door Scope DS1000 [Mount (1) at 60” AFF and (1) at 42” AFF TO BOTTOM] **(INACTIVE DOOR ONLY)** | 2 |

### 4.47 HARDWARE GROUP #10.3.WS - PAIR AT RECEIVING (WIND-STORM RATED AREAS-W/34” MAX USEABLE EGRESS @ ACTIVE DOOR ONLY)

| | |
|---|---|
| 3070 EXTERIOR HM DOOR INACTIVE WS RATED-ASTRAGAL | 1 |
| 3070 EXTERIOR HM DOOR ACTIVE WS RATED-CVR-ASTRAGAL | 1 |
| 6070 EXTERIOR HOLLOW METAL FRAME WINDSTORM RATED | 1 |
| Exterior Hinge BB1279 4 1/2 X 4 1/2 NRP 26D | 6 |
| Von Duprin Concealed Vertical Rod HH9847EO-F X 338 X 304L X 425-SNB | 2 |
| 945T Contact | 2 |
| Exit Alarm EAX-500 | 1 |
| Mortise Cylinder Housing 80-102 X 138 626 | 1 |
| Construction Core - Green 80-035 | 1 |
| Closer 3521T 689 | 2 |
| Protection Plate 190S 8" X 34" US32D | 2 |
| Threshold 2005 AV 72” Tapcon Screws (4) | 1 |
| Door Sweep D608A X 36" | 2 |
| Gasketing S88 x 20' | 1 |
| Astragal Weatherstrip 303AV 84” | 2 |

| | |
|---|---|
| Drip Cap 16A X 76" | 1 |
| Door Viewer 1755 [Mount (1) at 60” and (1) at 42” AFF to Bottom] (Inactive Door Only) | 2 |

### 4.48 HARDWARE GROUP #10.3.BOP – EXTERIOR AT BOPIS

| | |
|---|---|
| 3070 EXTERIOR HOLLOW METAL DOOR W/RACEWAY & ELEC HINGE - BOPIS | 1 |
| 3070 EXTERIOR HOLLOW METAL DOOR W/ASTRAGAL - BOPIS | 1 |
| 6070 EXTERIOR HOLLOW METAL FRAME W/ELEC HINGE 534 BOPIS | 1 |
| Exterior Hinge TA2314 4 1/2 X 4 1/2 NRP 26D | 5 |
| Electric Hinge TA2714 QC4D 4 1/2 X 4 1/2 26D | 1 |
| ElectroLynx Harness QC-C1500 | 1 |
| ElectroLynx Harness QC-C003 | 1 |
| Lockset ND80BD RHO 10-025 13-247 XN12-005 626 | 1 |
| Construction Core - Green 80-035 | 1 |
| Pull 16 7 1/2" US28 | 1 |
| 297M Mounting Bracket | 2 |
| HES 1006CS Electric Strike | 1 |
| Automatic Flush Bolts 292D-US32D | 1 |
| Dustproof Strike 280X | 1 |
| Closer 3521T 689 | 2 |
| Coordinator 297D 72 USP | 1 |
| Threshold 896V X 72" MILL | 1 |
| Door Sweep D608A X 36" | 2 |
| Gasketing 5050B x 20' | 1 |
| Door Scope DS1000 Gray [Mount (1) at 60” and (1) at 42” AFF to Bottom] (Inactive Door Only) | 2 |
| Drip Cap 16A X 76" | 1 |

### 4.49 HARDWARE GROUP #10.4 - RECEIVING EXITS REQUIRING TRIM (COMBO AND TRIPLE PLAY STORES)

| | |
|---|---|
| 3070 EXTERIOR HOLLOW METAL DOOR | 1 |
| 3070 EXTERIOR HOLLOW METAL FRAME | 1 |
| Exterior Hinge TA2314 4 1/2 X 4 1/2 NRP 26D | 3 |
| Yale Egress Exit Device 7150 A K625 x CT7SD 630 36” | 1 |
| Exit Device Trim Storeroom AU626-F 630 | 1 |
| Rim Cylinder Housing K680 X 1 3/8” 626 | 1 |
| Blocking Ring 36-082 X 025 626 | 1 |
| Construction Core - Green 80-035 | 2 |
| Closer 3521T 689 | 1 |
| Protection Plate 190S 8” x 34” US32D | 1 |
| Handicap Threshold 413 X 36” AL | 1 |
| Door Sweep D608A X 36" | 1 |
| Gasketing 5050B x 17' | 1 |
| Drip Cap 16A X 40" | 1 |
| Door Scope DS1000 [Mount (1) at 60” AFF and (1) at 43” AFF TO BOTTOM] **(Receiving Doors ONLY)** | 2 |

### 4.50 HARDWARE GROUP #11.0 – COMPACTOR FIRE RATED

| | |
|---|---|
| 3535 EXTERIOR HOLLOW METAL DOOR RATED | 1 |
| 3535 EXTERIOR HOLLOW METAL FRAME RATED | 1 |
| Spring Hinge 1502 4 1/2 X 4 1/2 26D | 2 |
| Exit Latch AU-5428LN X 694 X 497 626 | 1 |
| Deadlock B-D152 X Less Core 626 | 1 |
| Construction Core - Green 80-035 | 2 |
| Door Silencer 307D Grey | 2 |
| Electromagnetic Holder 998 689 | 1 |
| Gasketing 5050B x 17' | 1 |

### 4.51 HARDWARE GROUP #12.1 - OVERHEAD DOORS BY OTHERS

| | |
|---|---|
| Padlock KS21D1200 | 3 |
| Construction Core - Green 80-035 | 3 |

### 4.52 HARDWARE GROUP #12.2 - ROOF HATCH BY OTHERS

| | |
|---|---|
| Padlock KS21D1200 | 1 |
| Construction Core - Green 80-035 | 1 |

### 4.53 HARDWARE GROUP #13.0 - GLASS AND ALUMINUM EXTERIOR DISPLAYS; SALES MALL GRILLES

| | |
|---|---|
| Cylinder Housing 80-103 X 138 626 | 1 |
| Construction Core - Green 80-035 | 1 |

### 4.54 HARDWARE GROUP #13.1 – DISPLAY OPENINGS WITH EZY JAMB & WD DRS

| | |
|---|---|
| 2070 INTERIOR HOLLOW WOOD DOOR | 1 |
| 2070 INTERIOR EZY JAMB FRAME | 1 |
| Roc York RY60 | 3 |
| Deadlock B-D152 LC 626 | 1 |
| Construction Core - Green 80-035 | 1 |
| Edge Pull RM751 US32D | 1 |
| Gasketing 5050B x 17' | 1 |

### 4.55 HARDWARE GROUP #14.0 - SALES MALL GRILLES

| | |
|---|---|
| Padlock KS21D1200 | 1 |
| Construction Core - Green 80-035 | 1 |

### 4.56 HARDWARE GROUP #15.2 -ALL FITTING ROOMS

| | |
|---|---|
| 3080 FLUSH WOOD FITTING ROOM DOOR | 1 |
| 3080 WELDED FRAMES FOR FITTING ROOMS P&D | 1 |
| Interior Hinge TA2714 4 1/2 X 4 1/2 26D | 4 |
| Lockset and Indicator LSA526 SCC KD 26D TEE US26D | 1 |
| Keys for Lockset | 2 |
| Closer 1101 689 | 1 |
| Hinge Pin Door Stop 69 X F14 | 2 |
| Door Silencer 307D Grey | 3 |

### 4.57 HARDWARE GROUP #15.3 -ALL FITTING ROOMS DOORS & FRAMES BY AFI

| | |
|---|---|
| Spring Hinge 1502 4 1/2 X 4 1/2 26D | 4 |
| Lockset and Indicator LSA526 SCC KD 26D TEE US26D | 1 |
| Floor Stop 242F US26D | 1 |
| Door Silencer 307D Grey | 3 |

### 4.58 HARDWARE GROUP #17.0 - ELECTRICAL ROOM (CHAIN LINK)

| | |
|---|---|
| Hoover 6045-S36 Deluxe Exit Bar Kit 36" (includes adjustable mounting plate) | 1 |
| Outside Trim for D6045-S36 D-6100 Gate Hardware | 1 |
| Mortise Cylinder Housing K660 1 3/8" 626 | 1 |
| Blocking Ring 36-079 X 050 | 1 |
| Construction Core - Green 80-035 | 1 |

### 4.59 HARDWARE GROUP #17.1 - ELECTRICAL ROOM (NON-CHAIN LINK) (DOOR SWINGS OUT OF ROOM)

| | |
|---|---|
| 3070 INTERIOR HOLLOW METAL DOOR | 1 |
| 3070 DRYWALL KD FRAME | 1 |
| Interior Hinge TA2714 4 1/2 X 4 1/2 26D | 3 |
| Yale Exit Device 7100F SN-134 630 | 1 |
| Exit Device Trim AU-626F 630 | 1 |
| Rim Cylinder Housing K680 1 3/8" 626 | 1 |
| Blocking Ring 36-082 X 025 - 626 | 1 |
| Construction Core - Green 80-035 | 1 |
| Closer 3501 689 | 1 |
| Floor Stop 242F US26D | 1 |
| Door Silencer 307D Grey | 3 |

### 4.60 HARDWARE GROUP #17.2 - EXTERIOR FROM CORRIDOR EXIT FIRE RATED

| | |
|---|---|
| 3070 EXTERIOR HOLLOW METAL DOOR RATED | 1 |
| 3070 EXTERIOR HOLLOW METAL FRAME RATED | 1 |
| Exterior Hinge TA2314 4 1/2 X 4 1/2 NRP 26D | 3 |
| Yale Exit Device 7100F 36” 630 | 1 |
| Closer 3521 689 | 1 |
| Threshold 896V X 36” MILL | 1 |
| Door Sweep D608A X 36" | 1 |
| Gasketing 5050B x 20' | 1 |
| Drip Cap 16A X 40" | 1 |

### 4.61 HARDWARE GROUP #17.2TRIM - EXTERIOR FROM STAIR EXITS FIRE RATED

| | |
|---|---|
| 3070 EXTERIOR HOLLOW METAL DOOR RATED | 1 |
| 3070 EXTERIOR HOLLOW METAL FRAME RATED | 1 |
| Exterior Hinge TA2314 4 1/2 X 4 1/2 NRP 26D | 3 |
| Yale Exit Device 7100F SN-134 630 | 1 |
| Exit Device Trim AU-626F 630 | 1 |
| Rim Cylinder Housing K680 1 3/8" 626 | 1 |
| Blocking Ring 36-082 X 025 – 626 | 1 |
| Construction Core - Green 80-035 | 1 |
| Closer 3521 689 | 1 |
| Threshold 896V X 36” MILL | 1 |
| Door Sweep D608A X 36" | 1 |
| Gasketing 5050B x 17' | 1 |
| Drip Cap 16A X 40" | 1 |

### 4.62 HARDWARE GROUP #17.2.3670 - EXTERIOR FROM STAIR EXITS FIRE RATED

| | |
|---|---|
| 3670 EXTERIOR HOLLOW METAL DOOR RATED | 1 |
| 3670 EXTERIOR HOLLOW METAL FRAME RATED | 1 |
| Exterior Hinge TA2314 4 1/2 X 4 1/2 NRP 26D | 3 |
| Yale Exit Device 7100F SN-134 630 | 1 |
| Closer 3521 689 | 1 |
| Threshold 896V X 42” MILL | 1 |
| Door Sweep D608A X 42" | 1 |
| Gasketing 5050B x 20' | 1 |
| Drip Cap 16A X 46" | 1 |

### 4.63 HARDWARE GROUP #17.2.3870 - EXTERIOR FROM STAIR EXITS FIRE RATED

| | |
|---|---|
| 3870 EXTERIOR HOLLOW METAL DOOR RATED | 1 |
| 3870 EXTERIOR HOLLOW METAL FRAME RATED | 1 |
| Exterior Hinge TA2314 4 1/2 X 4 1/2 NRP 26D | 3 |
| Yale Exit Device 7100F SN-134 630 48” (Contractor to cut down in field) | 1 |
| Closer 3521 689 | 1 |
| Threshold 896V X 44” MILL | 1 |
| Door Sweep D608A X 44" | 1 |
| Gasketing 5050B x 20' | 1 |
| Drip Cap 16A X 48" | 1 |

### 4.64 HARDWARE GROUP #17.2.4070 - EXTERIOR FROM STAIR EXITS FIRE RATED

| | |
|---|---|
| 4070 EXTERIOR HOLLOW METAL DOOR RATED | 1 |
| 4070 EXTERIOR HOLLOW METAL FRAME RATED | 1 |
| Exterior Hinge TA2314 4 1/2 X 4 1/2 NRP 26D | 3 |
| Yale Exit Device 7100F SN-134 630 48” | 1 |
| Closer 3521 689 | 1 |
| Threshold 896V X 48” MILL | 1 |
| Door Sweep D608A X 48" | 1 |
| Gasketing 5050B x 20' | 1 |
| Drip Cap 16A X 52" | 1 |

### 4.65 HARDWARE GROUP #17.2.6070 -EXTERIOR PAIR FROM STAIR EXIT FIRE RATED

| | |
|---|---|
| 3070 EXTERIOR HOLLOW METAL DOOR RATED | 2 |
| 6070 EXTERIOR HOLLOW METAL FRAME RATED | 1 |
| Exterior Hinge TA2314 4 1/2 X 4 1/2 NRP 26D | 6 |
| Yale Egress Exit Device 7100F SN-134 630 | 2 |
| Keyed Mullion KRM200F 84" 600 | 1 |
| Mortise Cylinder Housing K660 X 1 3/8" 626 | 1 |
| Blocking Ring 36-079 050 626 | 1 |
| Construction Core - Green 80-035 | 1 |
| Closer 3521 689 | 2 |
| Threshold 896V X 72” MILL | 1 |
| Door Sweep D608A X 36" | 2 |
| Gasketing 5050B x 17' | 2 |
| Drip Cap 16A X 76" | 1 |

### 4.66 HARDWARE GROUP #17.3.3080 – OUTSIDE FIELD (CHAIN LINK)

| | |
|---|---|
| Hoover 6037-S36 Alarm Exit Bar Kit 36" (includes mounting plate)) | 1 |
| Outside Trim for D-6100 Gate Hardware | 1 |
| Mortise Cylinder Housing K660 1 3/8" 626 | 1 |
| Blocking Ring 36-079 X 050 | 1 |
| Construction Core - Green 80-035 | 1 |

### 4.67 HARDWARE GROUP #17.3.4080 – OUTSIDE FIELD (CHAIN LINK)

| | |
|---|---|
| Hoover 6037-S48 Alarm Exit Bar Kit 48" (includes mounting plate)) | 1 |
| Outside Trim for D-6100 Gate Hardware | 1 |
| Mortise Cylinder Housing K660 1 3/8" 626 | 1 |
| Blocking Ring 36-079 X 050 | 1 |
| Construction Core - Green 80-035 | 1 |

### 4.68 HARDWARE GROUP #18.0 - CASED OPENINGS

| | |
|---|---|
| 3070 CASED OPEN HOLLOW METAL FRAME WELDED | 1 |
| 3090 CASED OPEN HOLLOW METAL FRAME WELDED | 1 |
| 3670 CASED OPEN HOLLOW METAL FRAME WELDED | 1 |
| 3870 CASED OPEN HOLLOW METAL FRAME WELDED | 1 |
| 4070 CASED OPEN HOLLOW METAL FRAME WELDED | 1 |
| 6090 CASED OPEN HOLLOW METAL FRAME WELDED | 1 |
| 8070 CASED OPEN HOLLOW METAL FRAME WELDED | 1 |
| 3070 DRYWALL KD FRAME | 1 |
| 4070 DRYWALL KD FRAME | 1 |

### 4.69 HARDWARE GROUP #18.1 - IMPACT DOORS AND CASED OPENINGS

| | |
|---|---|
| DuraLite Retailer - High Impact Door 3090 Pair | 1 |
| 6090 CASED OPEN HOLLOW METAL FRAME | 1 |

### 4.70 HARDWARE GROUP #19.0 - ROOF ACCESS DOORS USED ON COMBO/TRIPLE PLAY STORES

| | |
|---|---|
| 3040 EXTERIOR HOLLOW METAL DOOR | 1 |
| 3040 EXTERIOR HOLLOW METAL FRAME | 1 |
| Exterior Hinge TA2314 4 1/2 X 4 1/2 NRP 26D | 2 |
| Lockset B AU 5405LN 626 | 1 |
| Closer 3521T 689 | 1 |
| Construction Core - Green 80-035 | 1 |
| Gasketing 5050B x 17' | 1 |
| Drip Cap 16A X 40" | 1 |

### 4.71 HARDWARE GROUP #KEYCAB

| | |
|---|---|
| Key Cabinet Lund Model 1301 | 1 |

### 4.72 HARDWARE GROUP #EXTRA

| | |
|---|---|
| Extra Fitting Room Keys | 13 for SLP or 17 for TLP/Combo |

### 4.73 HARDWARE GROUP #MISC

| | |
|---|---|
| Power Supply BPS-24-4 | 1 per 4 EA 7150D or IMXDA |

### 4.74 HARDWARE GROUP #CNTL KEY

| | |
|---|---|
| Construction Keys KB628XA | 1 |

### 4.75 HARDWARE GROUP #OPKEYS

| | |
|---|---|
| Operating Keys KB628XA | 5 |

### 4.76 HARDWARE GROUP #EXTRAS PER DICKS - INCLUDES KEY CABINET, PADLOCKS, CORES, EXTRA CYLINDERS, KEYS

| | |
|---|---|
| Construction Keys KB628XA - control key | 1 |
| Padlock KS21D1200 | See Note 1 |
| Duplicate Cut Key KY-327600-9A-99 Keymark S | See Note 1 |
| IC 7-Pin Core 33K700007-26-9AS | See Note 1 |

A. Notes:
   1. Number to be determined based on number of openings needing cores. (see attached Key and Core Form by project type)
   2. All items in this hardware group must be purchased from Bass Security Services, Inc.

**END OF SECTION**

## SECTION 09 2116
## GYPSUM BOARD ASSEMBLIES

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Performance criteria for gypsum board assemblies.

B. Metal stud wall framing.

C. Acoustic insulation.

D. Gypsum sheathing.

E. Cementitious backing board.

F. Gypsum wallboard.

G. Joint treatment and accessories.

### 1.02 REFERENCE STANDARDS

A. AISI S100-12 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2012.

B. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2010 (Reaffirmed 2016).

C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.

D. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.

E. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2015.

F. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members; 2014.

G. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2012.

H. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2015.

I. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2013.

J. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2015.

K. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2014.

L. ASTM C1047 - Standard Specification for Accessories For Gypsum Wallboard and Gypsum Veneer Base; 2014a.

M. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2013.

N. ASTM C1178/C1178M - Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel; 2013.

O. ASTM C1280 - Standard Specification for Application of Exterior Gypsum Panel Products for Use as Sheathing; 2013a.

P. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2014.

Q. ASTM C1629/C1629M - Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels; 2015.

R. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2012.

S. GA-216 - Application and Finishing of Gypsum Board; 2013.

T. GA-226 - Application of Gypsum Board to Form Curved Surfaces; Gypsum Association; 2008.

U. UL (FRD) - Fire Resistance Directory; current edition.

**1.03 SUBMITTALS**

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on metal framing, gypsum board, accessories, and joint finishing system.

C. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

**1.04 QUALITY ASSURANCE**

A. Installer Qualifications: Company specializing in performing gypsum board installation and finishing, with minimum 3 years of experience.

**PART 2 PRODUCTS**

**2.01 GYPSUM BOARD ASSEMBLIES**

A. Provide completed assemblies complying with ASTM C840 and GA-216.

B. Fire Rated Assemblies: Provide completed assemblies with the following characteristics:
   1. UL Assembly Numbers: Provide construction equivalent to that listed for the particular assembly in the current UL (FRD).

**2.02 METAL FRAMING MATERIALS**

A. Non-Loadbearing Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/120 at 5 psf.
   1. Studs: "C" shaped with flat or formed webs with knurled faces.
   2. Runners: U shaped, sized to match studs.
   3. Furring: Hat-shaped sections, minimum depth of 7/8 inch.

B. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection using slotted holes, screws and anti-friction bushings, preventing rotation of studs while maintaining structural performance of partition.
   1. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with AISI S100-12.
   2. Material: ASTM A653/A653M steel sheet, SS Grade 50/340, with G60/Z180 hot dipped galvanized coating.

C. Sheet Metal Backing: 0.043 inch thick, galvanized, 6" wide.

**2.03 BOARD MATERIALS**

A. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
   1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
   2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
      a. Mold-resistant board is required whenever board is being installed before the building is enclosed and conditioned.
      b. Mold resistant board is required in toilet rooms and janitor walls and where indicated in drawings.
   3. At Assemblies Indicated with Fire-Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.
   4. Thickness:
      a. Vertical Surfaces: 5/8 inch.

B. Abuse Resistant Wallboard:
   1. Application: Around framed columns or as indicated on drawings.
   2. Surface Abrasion: Level 2, minimum, when tested in accordance with ASTM C1629/C1629M.
   3. Indentation: Level 1, minimum, when tested in accordance with ASTM C1629/C1629M.
   4. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
   5. Paper-Faced Type: Gypsum wallboard as defined in ASTM C1396/C1396M.
   6. Type: Fire resistance rated Type X, UL or WH listed.
   7. Thickness: 5/8 inch.
   8. Edges: Tapered.

C. Backing Board For Wet Areas:
   1. Application: Surfaces behind tile in wet areas including toilet rooms and janitors walls.
   2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
   3. Glass Mat Faced Board: Coated glass mat water-resistant gypsum backing panel as defined in ASTM C1178/C1178M.
      a. Fire Resistant Type: Type X core, thickness 5/8 inch.

D. Backing Board For Non-Wet Areas: Water-resistant gypsum backing board as defined in ASTM C1396/C1396M; sizes to minimum joints in place; ends square cut.
   1. Application: Vertical surfaces behind thinset tile, except in wet areas.
   2. Type X Thickness: 5/8 inch.
   3. Edges: Tapered.

E. Ceiling Board: Special sag resistant gypsum ceiling board as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
   1. Application: Ceilings, unless otherwise indicated.
   2. Thickness: 1/2 inch.
   3. Edges: Tapered.

F. Exterior Sheathing Board: Sizes to minimize joints in place; ends square cut.
   1. Application: Exterior sheathing, unless otherwise indicated.
   2. Glass Mat Faced Sheathing: Glass mat faced gypsum substrate as defined in ASTM C1177/C1177M.
   3. Regular Board Thickness: 5/8 inch.
   4. Edges: Square.

G. Exterior Soffit Board: Exterior gypsum soffit board as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
   1. Application: Ceilings and soffits in protected exterior areas, unless otherwise indicated.
   2. At Assemblies Indicated with Fire-Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X.
   3. Regular Type Thickness: 1/2 inch.
   4. Edges: Tapered.

## 2.04 ACCESSORIES

A. Acoustic Insulation: ASTM C665; preformed glass fiber, friction fit type, unfaced. Thickness: 3 inch.

B. Water-Resistive Barrier: As specified in Section 07 2500.

C. Finishing Accessories: ASTM C1047, galvanized steel or rolled zinc, unless noted otherwise.
   1. Types: As detailed or required for finished appearance.
   2. Special Shapes: In addition to conventional corner bead and control joints, provide U-bead at exposed panel edges.

D. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
   1. Tape: 2 inch wide, coated glass fiber tape for joints and corners, except as otherwise indicated.

2. Tape: 2 inch wide, creased paper tape for joints and corners, except as otherwise indicated.
3. Ready-mixed vinyl-based joint compound.
4. Powder-type vinyl-based joint compound.
5. Chemical hardening type compound.

E. High Build Drywall Surfacer: Vinyl acrylic latex-based coating for spray application, designed to take the place of skim coating and separate paint primer in achieving Level 5 finish.

F. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inch in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion resistant.

G. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws, corrosion resistant.

H. Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.

I. Exterior Soffit Vents: One piece, perforated, ASTM B221 6063 T5 alloy aluminum, with edge suitable for direct application to gypsum board and manufactured especially for soffit application. Provide continuous vent.

J. Security Mesh: Expanded metal mesh type.
1. Products:
a. Amico; ASM .75-13F Medium security expanded metal mesh: www.amico-securityproducts.com.
b. Metalex; F750-13 Barrier Mesh: www.metlx.com
c. Clark Dietrich; BM75-13 Barrier Mesh: www.clarkdietrich.com

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.

### 3.02 FRAMING INSTALLATION

A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.

B. Studs: Space studs at 16 inches on center.
1. Extend partition framing to height indicated on drawings.
2. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.
3. Partitions Penetrating Ceiling, not Terminating at Structure: Brace top track securely to structure at 48 inches on center, unless otherwise indicated.
4. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer's instructions; verify free movement of top of stud connections; do not leave studs unattached to track.

C. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.

D. Standard Wall Furring: Install at concrete and masonry walls scheduled to receive gypsum board, not more than 4 inches from floor and ceiling lines and abutting walls. Secure in place on alternate channel flanges at maximum 24 inches on center.
1. Orientation: Horizontal.
2. Spacing: As indicated.

E. Blocking: Use sheet metal backing secured to studs. Provide blocking for support of wall cabinets, toilet accessories, hardware, opening frames, and other wall mounted items requiring secure attachment.
1. Use wood blocking secured to studs for plumbing fixtures, toilet partitions, grab bars, handrails and other items indicated on the drawings to be supported with wood blocking.

### 3.03 ACOUSTIC ACCESSORIES INSTALLATION

A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.

### 3.04 BOARD INSTALLATION

A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

B. Single-Layer Non-Rated: Install gypsum board perpendicular to framing, with ends and edges occurring over firm bearing.
   1. Exception: Tapered edges to receive joint treatment at right angles to framing.

C. Double-Layer Non-Rated: Use gypsum board for first layer, placed parallel to framing or furring members, with ends and edges occurring over firm bearing. Use glass mat faced gypsum board at exterior walls and at other locations as indicated. Place second layer perpendicular to framing or furring members. Offset joints of second layer from joints of first layer.

D. Fire-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.

E. Exterior Sheathing: Comply with ASTM C1280. Install sheathing vertically, with edges butted tight and ends occurring over firm bearing.

F. Exterior Soffits: Install exterior soffit board perpendicular to framing, with staggered end joints over framing members or other solid backing.

G. Backing Board: Install over steel framing members where indicated, in accordance with ANSI A108.11 and manufacturer's instructions.

H. Installation on Metal Framing: Use screws for attachment of gypsum board except face layer of non-rated double-layer assemblies, which may be installed by means of adhesive lamination.

I. Curved Surfaces: Apply gypsum board to curved substrates in accordance with GA-226.

J. Moisture Protection: Treat cut edges and holes in moisture resistant gypsum board and exterior gypsum soffit board with sealant.

### 3.05 INSTALLATION OF TRIM AND ACCESSORIES

A. Control Joints: Place control joints consistent with lines of building spaces and as follows:
   1. Space in accordance with ASTM C840 and as indicated.
   2. Not more than 30 feet apart on walls and ceilings over 50 feet long.
   3. At exterior soffits, not more than 30 feet apart in both directions.
   4. Where partition, wall or ceiling traverses a construction joint (expansion, seismic, or building control element) in the base building structure.
   5. Where floor supported partition adjoins ceiling supported structures.
   6. Avoid placing joints where they will interrupt surface applied graphics.

B. Corner Beads: Install at external corners, using longest practical lengths.

C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

D. Exterior Soffit Vents: Install according to manufacturer's written instructions and in locations indicated on the drawings. Provide vent area specified.

E. Security Mesh: Install according to maufacturer's written instructions at all interior metal framed demising walls and in locations indicated on drawings.

### 3.06 JOINT TREATMENT

A. Glass Mat Faced Gypsum Board and Exterior Glass Mat Faced Sheathing: Use fiberglass joint tape, bedded and finished with chemical hardening type joint compound.

B. Paper Faced Gypsum Board: Use paper joint tape, bedded with ready-mixed vinyl or powder-type vinyl for interior applications, and chemical hardening type for exterior or wet locations joint compound and finished with matching joint compound.

C. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:

1. Level 5: Walls and ceilings to receive semi-gloss or gloss paint finish and other areas specifically indicated.
2. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
3. Level 3: Walls to receive textured wall finish.
4. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
5. Level 1: Fire rated wall areas above finished ceilings, whether or not accessible in the completed construction.

D. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
   1. Feather coats of joint compound so that camber is maximum 1/32 inch.

E. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.

F. Fill and finish joints and corners of cementitious backing board as recommended by manufacturer.

**3.07 TOLERANCES**

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

**END OF SECTION**

**SECTION 09 3000**

**TILING**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Tile for floor applications.

B. Tile for wall applications.

C. Coated glass mat backer board as tile substrate.

D. Tile trim.

E. Non-tile trim.

### 1.02 REFERENCE STANDARDS

A. ANSI A108/A118/A136.1 - American National Standard Specifications for the Installation of Ceramic Tile (Compendium); 2013.1.

B. ANSI A108.1a - American National Standard Specifications for Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar; 2014.

C. ANSI A108.1b - American National Standard Specifications for Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar; 1999 (Reaffirmed 2010).

D. ANSI A108.1c - 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 Bed with Dry-Set or Latex-Portland Cement; 1999 (Reaffirmed 2010).

E. ANSI A108.4 - American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesives or Water Cleanable Tile-Setting Epoxy Adhesive; 2009 (Revised).

F. ANSI A108.5 - American National Standard Specifications for Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar; 1999 (Reaffirmed 2010).

G. ANSI A108.6 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy; 1999 (Reaffirmed 2010).

H. ANSI A108.8 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant Furan Resin Mortar and Grout; 1999 (Reaffirmed 2010).

I. ANSI A108.9 - American National Standard Specifications for Installation of Ceramic Tile with Modified Epoxy Emulsion Mortar/Grout; 1999 (Reaffirmed 2010).

J. ANSI A108.10 - American National Standard Specifications for Installation of Grout in Tilework; 1999 (Reaffirmed 2010).

K. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2010 (Reaffirmed 2016).

L. ANSI A108.12 - American National Standard for Installation of Ceramic Tile with EGP (Exterior Glue Plywood) Latex-Portland Cement Mortar; 1999 (Reaffirmed 2010).

M. ANSI A108.13 - American National Standard for Installation of Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone; 2005 (Reaffirmed 2010).

N. ANSI A118.4 - American National Standard Specifications for Modified Dry-Set Cement Mortar; 2012 (Revised).

O. ANSI A118.6 - American National Standard Specifications for Standard Cement Grouts for Tile Installation; 2010 (Revised).

P. ANSI A118.10 - American National Standard Specifications for Load Bearing, Bonded, Waterproof Membranes For Thin-Set Ceramic Tile And Dimension Stone Installation; 2014.

Q. ANSI A137.1 - American National Standard Specifications for Ceramic Tile; 2013.1.

R. ASTM C1178/C1178M - Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel; 2013.

S. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation; 2015.

### 1.03 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

### 1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.

C. Master Grade Certificate: Submit for each type of tile, signed by the tile manufacturer and tile installer.

D. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods.

E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.
   2. Extra Tile: 10 square feet of each size, color, and surface finish combination.

### 1.05 QUALITY ASSURANCE

A. Maintain one copy of and ANSI A108/A118/A136.1 and TCNA (HB) on site.

B. Installer Qualifications: Company specializing in performing tile installation, with minimum of five years of experience.

## PART 2 PRODUCTS

### 2.01 TILE

A. Tile and accessories are to be supplied and installed by National Account Vendor #3.

B. Tile: ANSI A137.1, standard grade. And as scheduled on drawings.

### 2.02 TRIM AND ACCESSORIES

A. Trim: Matching tile shapes in sizes coordinated with field tile unless otherwise indicated.
   1. Applications:
      a. Open Edges: Bullnose.
      b. Inside Corners: Jointed.
      c. Floor to Wall Joints: Cove base.
   2. Manufacturers: Same as for tile.

B. Non-tile Trim: Finish, style and dimensions to suit application, for setting using tile mortar or adhesive.
   1. Applications:
      a. Open edges of floor tile.
      b. Transition between floor finishes of different heights.
      c. Expansion and control joints, floor and wall.

### 2.03 SETTING MATERIALS

A. Latex-Portland Cement Mortar Bond Coat: ANSI A118.4.
   1. Applications: Use this type of bond coat where indicated and where no other type of bond coat is indicated.

### 2.04 GROUTS

A. Standard Grout: ANSI A118.6 standard cement grout.
   1. Applications: Use this type of grout where indicated and where no other type of grout is indicated.

2. Use sanded grout for joints 1/8 inch wide and larger; use unsanded grout for joints less than 1/8 inch wide.
3. Color(s): As indicated on drawings.

**2.05 MAINTENANCE MATERIALS**

A. Grout Sealer: Liquid-applied, moisture and stain protection for existing or new Portland cement grout.
1. Composition: Water-based colorless silicone.

**2.06 ACCESSORY MATERIALS**

A. Waterproofing Membrane at floors other than slab-on-grade : Specifically designed for bonding to cementitious substrate under thick mortar bed or thin-set tile; complying with ANSI A118.10.
1. Fluid or Trowel Applied Type:
a. Material: Synthetic rubber or Acrylic.
b. Thickness: 25 mils, minimum, dry film thickness.

B. Backer Board: Coated glass mat type complying with ASTM C1178/C1178M; inorganic fiberglass mat on both surfaces and integral acrylic coating vapor retarder.

C. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement-based product provided by manufacturer of tile-setting materials.

D. Mesh Tape: 2 inch wide self-adhesive fiberglass mesh tape.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.

B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.

C. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of setting materials to sub-floor surfaces.

D. Verify that concrete sub-floor surfaces are ready for tile installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by tile manufacturer and setting materials manufacturer.

E. Verify that required floor-mounted utilities are in correct location.

**3.02 PREPARATION**

A. Protect surrounding work from damage.

B. Vacuum clean surfaces and damp clean.

C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.

D. Install backer board in accordance with ANSI A108.11 and board manufacturer's instructions. Tape joints and corners, cover with skim coat of setting material to a feather edge.

**3.03 INSTALLATION - GENERAL**

A. Install tile and grout in accordance with applicable requirements of ANSI A108.1a through ANSI A108.13, manufacturer's instructions, and TCNA (HB) recommendations.

B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.

C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.

D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.

E. Form internal angles square and external angles bullnosed.

F. Install non-tile trim in accordance with manufacturer's instructions.

G. Sound tile after setting. Replace hollow sounding units.

H. Keep control and expansion joints free of mortar, grout, and adhesive.

I. Prior to grouting, allow installation to completely cure; minimum of 48 hours.

J. Grout tile joints unless otherwise indicated. Use standard grout unless otherwise indicated.

K. At changes in plane and tile-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.

**3.04 INSTALLATION - FLOORS - THIN-SET METHODS**

A. Over interior concrete substrates, install in accordance with TCNA (HB) Method F113, dry-set or latex-Portland cement bond coat, with standard grout, unless otherwise indicated.

1. Where waterproofing membrane is indicated, install in accordance with TCNA (HB) Method F122, with latex-Portland cement grout.

**3.05 INSTALLATION - WALL TILE**

A. Over coated glass mat backer board on studs, install in accordance with TCNA (HB) Method W245.

B. Over gypsum wallboard on wood or metal studs install in accordance with TCNA (HB) Method W243, thin-set with dry-set or latex-Portland cement bond coat, unless otherwise indicated.

**3.06 CLEANING**

A. Clean tile and grout surfaces.

**3.07 PROTECTION**

A. Do not permit traffic over finished floor surface until mortar and grout have adequately cured.

**END OF SECTION**

# SECTION 09 5100
# ACOUSTICAL CEILINGS

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Suspended metal grid ceiling system.

B. Acoustical units.

### 1.02 REFERENCE STANDARDS

A. ASTM C635/C635M - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2017.

B. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels; 2013.

C. ASTM E580/E580M - Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions; 2017.

D. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2014.

### 1.03 ADMINISTRATIVE REQUIREMENTS

A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.

B. Do not install acoustical units until after interior wet work is dry.

### 1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on suspension system components.

C. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.

### 1.05 FIELD CONDITIONS

A. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. Acoustic Tiles/Panels:
   1. Armstrong World Industries, Inc; : www.armstrong.com.
   2. Substitutions: Not permitted.

B. Suspension Systems:
   1. Same as for acoustical units.

### 2.02 ACOUSTICAL UNITS

A. Acoustical Units - General: ASTM E1264, Class A.

B. Acoustical Tile: Painted mineral fiber, ASTM E1264 Type III, with the following characteristics:
   1. Size: 24 by 24 inches.
   2. Thickness: 5/8 inches.
   3. Edge: Square.
   4. Surface Color: White.

### 2.03 SUSPENSION SYSTEM(S)

A. Metal Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with stabilizer bars, clips, splices, perimeter moldings, and hold down clips as required.

## 2.04 ACCESSORIES

A. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.

B. Perimeter Moldings: Same material and finish as grid.

C. Touch-up Paint: Type and color to match acoustical and grid units.

# PART 3 EXECUTION

## 3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that layout of hangers will not interfere with other work.

## 3.02 INSTALLATION - SUSPENSION SYSTEM

A. Install suspension system in accordance with ASTM C636/C636M, ASTM E580/E580M, and manufacturer's instructions and as supplemented in this section.

B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.

C. Lay out system to a balanced grid design with edge units no less than 50 percent of acoustical unit size.

D. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.

E. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.

F. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.

G. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.

H. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.

I. Do not eccentrically load system or induce rotation of runners.

J. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
   1. Use longest practical lengths.
   2. Overlap and rivet corners.

## 3.03 INSTALLATION - ACOUSTICAL UNITS

A. Install acoustical units in accordance with manufacturer's instructions.

B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.

C. Fit border trim neatly against abutting surfaces.

D. Install units after above-ceiling work is complete.

E. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.

F. Cutting Acoustical Units:
   1. Make field cut edges of same profile as factory edges.

G. Where round obstructions occur, provide preformed closures to match perimeter molding.

H. Install hold-down clips on panels within 20 ft of an exterior door.

## 3.04 TOLERANCES

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.

B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

**END OF SECTION**

## SECTION 09 6500
## RESILIENT FLOORING

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

A. Resilient tile flooring.

B. Resilient base.

C. Installation accessories.

#### 1.02 REFERENCE STANDARDS

A. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2011.

B. ASTM F1066 - Standard Specification for Vinyl Composition Floor Tile; 2004, with Editorial Revision (2014).

C. ASTM F1700 - Standard Specification for Solid Vinyl Floor Tile; 2013a.

D. ASTM F1861 - Standard Specification for Resilient Wall Base; 2016.

#### 1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.
   2. Extra Flooring Material: One unopened carton of each type and color.

#### 1.04 DELIVERY, STORAGE, AND HANDLING

A. Store all materials off of the floor in an acclimatized, weather-tight space.

B. Maintain temperature in storage area between 55 degrees F and 90 degrees F.

#### 1.05 FIELD CONDITIONS

A. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F.

B. Close spaces to traffic during tile installation.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

A. Resilient flooring and base are to be supplied and installed by National Account Vendor #3.

#### 2.02 TILE FLOORING

A. Vinyl Composition Tile: Homogeneous, with color extending throughout thickness.
   1. Minimum Requirements: Comply with ASTM F1066, of Class corresponding to type specified.
   2. Size: As indicated on drawings.
   3. Thickness: 0.125 inch.
   4. Color: As indicated on drawings.

B. Vinyl Plank Tile: Printed film type, with transparent or translucent wear layer.
   1. Minimum Requirements: Comply with ASTM F1700, of Class corresponding to type specified.
   2. Plank Tile Size: As indicated on drawings.
   3. Wear Layer Thickness: 0.020 inch.
   4. Total Thickness: 0.125 inch.
   5. Color: As indicated on drawings.

## 2.03 RESILIENT BASE

A. Resilient Base: ASTM F1861, Type TS rubber, vulcanized thermoset; top set Style B, Cove.
   1. Height, Color and Finish: As indicated on drawings.
   2. Thickness: 0.125 inch.

## 2.04 ACCESSORIES

A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.

B. Primers, Adhesives, and Seam Sealer: Waterproof; types recommended by flooring manufacturer.
   1. Provide only products having lower VOC content than allowed by local regulation.

C. Moldings, Transition and Edge Strips: As indicated on drawings.

D. Sealer and Wax: Types recommended by flooring manufacturer.

E. Floor Care Products:
   1. Spartan I-Shine Floor Finish. Refer to Section 01 7400.

# PART 3 EXECUTION

## 3.01 EXAMINATION

A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.

B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive resilient base.

C. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for resilient flooring installation by testing for moisture and pH.
   1. Test in accordance with ASTM F710.
   2. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.

D. Verify that required floor-mounted utilities are in correct location.

## 3.02 PREPARATION

A. Prepare floor substrates as recommended by flooring and adhesive manufacturers and in accordance with ASTM F710.

B. Remove sub-floor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface.

C. Prohibit traffic until filler is fully cured.

D. Clean substrate.

E. Apply primer as required to prevent "bleed-through" or interference with adhesion by substances that cannot be removed.

## 3.03 INSTALLATION - GENERAL

A. Starting installation constitutes acceptance of sub-floor conditions.

B. Install in accordance with manufacturer's written instructions.

C. Spread only enough adhesive to permit installation of materials before initial set.

D. Fit joints and butt seams tightly.

E. Set flooring in place, press with heavy roller to attain full adhesion.

F. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.

G. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.

H. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

**3.04 INSTALLATION - TILE FLOORING**

A. Mix tile from container to ensure shade variations are consistent when tile is placed, unless otherwise indicated in manufacturer's installation instructions.

B. Install square tile to basket weave pattern with grain direction alternating between reversed in adjacent tile. Allow minimum 1/2 full size tile width at room or area perimeter.

**3.05 INSTALLATION - RESILIENT BASE**

A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.

B. Miter internal corners. At external corners, 'V' cut back of base strip to 2/3 of its thickness and fold. At exposed ends, use premolded units.

C. Install base on solid backing. Bond tightly to wall and floor surfaces.

D. Scribe and fit to door frames and other interruptions.

**3.06 CLEANING**

A. Remove excess adhesive from floor, base, and wall surfaces without damage.

B. Clean in accordance with manufacturer's written instructions.

C. Apply Spartan I-Shine Floor Finish. Refer to Section 01 7400.

**3.07 PROTECTION**

A. Prohibit traffic on resilient flooring for 48 hours after installation.

**END OF SECTION**

# SECTION 09 6813
# TILE CARPETING

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Carpet tile, fully adhered.

### 1.02 REFERENCE STANDARDS

A. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2011.

### 1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.

C. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.
   2. Extra Carpet Tiles: Quantity equal to 5 percent of total installed of each color and pattern installed.

### 1.04 FIELD CONDITIONS

A. Store materials in area of installation for minimum period of 24 hours prior to installation.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. Carpet tiles to be supplied and installed by National Account Vendor #3.

### 2.02 MATERIALS

A. Tile Carpeting: , manufactured in one color dye lot.
   1. Product: DesignStepEntrance Carpet manufactured by Impact Specialties.
   2. Tile Size: 19 3/4 by19 3/4 inch, nominal.
   3. Thickness: 3/8 inch.
   4. Color: Hearty Moss.
   5. Pattern: Power Point.

### 2.03 ACCESSORIES

A. Sub-Floor Filler: White premix latex; type recommended by flooring material manufacturer.

B. Carpet Tile Adhesive: Recommended by carpet tile manufacturer; releasable type.

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verify that sub-floor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive carpet tile.

B. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of adhesive materials to sub-floor surfaces.

C. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for flooring installation by testing for moisture and pH.
   1. Test in accordance with ASTM F710.
   2. Obtain instructions if test results are not within limits recommended by flooring material manufacturer and adhesive materials manufacturer.

D. Verify that required floor-mounted utilities are in correct location.

### 3.02 PREPARATION

A. Prepare floor substrates as recommended by flooring and adhesive manufacturers.

B. Remove sub-floor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with sub-floor filler.

C. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.

D. Vacuum clean substrate.

**3.03 INSTALLATION**

A. Starting installation constitutes acceptance of sub-floor conditions.

B. Install carpet tile in accordance with manufacturer's instructions.

C. Blend carpet from different cartons to ensure minimal variation in color match.

D. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps.

E. Lay carpet tile in square pattern, with pile direction alternating quarter turn to next unit, set parallel to building lines.

F. Locate change of color or pattern between rooms under door centerline.

G. Fully adhere carpet tile to substrate.

H. Trim carpet tile neatly at walls and around interruptions.

I. Complete installation of edge strips, concealing exposed edges.

**3.04 CLEANING AND PROTECTION**

A. Remove excess adhesive without damage, from floor, base, and wall surfaces.

B. Clean and vacuum carpet surfaces.

C. In all public areas, provide a temporary non staining paper or plastic sheet pathway in the direction of traffic.

**END OF SECTION**

# SECTION 09 6816
# SHEET CARPETING

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Carpet, direct-glued.

B. Accessories.

### 1.02 REFERENCE STANDARDS

A. ASTM D2859 - Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials; 2016.

B. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2014c.

C. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2011.

D. CRI 104 - Standard for Installation of Commercial Carpet; 2015.

E. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; 2015.

### 1.03 FIELD CONDITIONS

A. Store materials in area of installation for minimum period of 24 hours prior to installation.

B. Maintain minimum 70 degrees F ambient temperature 24 hours prior to, during and 24 hours after installation.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. Sheet carpeting to be supplied and installed by National Account Vendor #3

### 2.02 CARPET

A. Carpet: As indicated on drawings.
   1. Critical Radiant Flux: Minimum of 0.22 watts/sq cm, when tested in accordance with ASTM E648 or NFPA 253.
   2. Surface Flammability Ignition: Pass ASTM D2859 (the "pill test").

### 2.03 ACCESSORIES

A. Sub-Floor Filler: Type recommended by carpet manufacturer.

B. Moldings and Edge Strips: Vinyl, color as selected.

C. Seam Adhesive: Recommended by carpet manufacturer.

D. Carpet Adhesive: Recommended by carpet manufacturer.

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive carpet.

B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive carpet.

C. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of adhesives to sub floor surfaces.

D. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for flooring installation by testing for moisture and alkalinity (pH).
   1. Test in accordance with ASTM F710.

2. Obtain instructions if test results are not within limits recommended by flooring material manufacturer and adhesive materials manufacturer.

E. Verify that required floor-mounted utilities are in correct location.

**3.02 PREPARATION**

A. Prepare floor substrates as recommended by flooring and adhesive manufacturers.

B. Remove sub-floor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with sub-floor filler.

C. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.

D. Clean substrate.

**3.03 INSTALLATION - GENERAL**

A. Starting installation constitutes acceptance of sub-floor conditions.

B. Install carpet and cushion in accordance with manufacturer's instructions and CRI 104 (Commercial).

C. Verify carpet match before cutting to ensure minimal variation between dye lots.

D. Lay out carpet and locate seams in accordance with shop drawings.
1. Locate seams in area of least traffic, out of areas of pivoting traffic, and parallel to main traffic.
2. Do not locate seams perpendicular through door openings.
3. Align run of pile in same direction as anticipated traffic and in same direction on adjacent pieces.
4. Locate change of color or pattern between rooms under door centerline.
5. Provide monolithic color, pattern, and texture match within any one area.

E. Install carpet tight and flat on subfloor, well fastened at edges, with a uniform appearance.

**3.04 DIRECT-GLUED CARPET**

A. Double cut carpet seams, with accurate pattern match. Make cuts straight, true, and unfrayed. Apply seam adhesive to cut edges of woven carpet immediately.

B. Apply contact adhesive to floor uniformly at rate recommended by manufacturer. After sufficient open time, press carpet into adhesive.

C. Apply seam adhesive to the base of the edge glued down. Lay adjoining piece with seam straight, not overlapped or peaked, and free of gaps.

D. Roll with appropriate roller for complete contact of adhesive to carpet backing.

E. Trim carpet neatly at walls and around interruptions.

F. Complete installation of edge strips, concealing exposed edges. Bind cut edges where not concealed by edge strips.

**3.05 CLEANING AND PROTECTION**

A. Remove excess adhesive from floor and wall surfaces without damage.

B. Clean and vacuum carpet surfaces.

C. In all public areas, provide a temporary non staining paper or plastic sheet pathway in the direction of traffic.

**END OF SECTION**

## SECTION 09 9000
## PAINTING AND COATING

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints, stains, and other coatings.

C. Scope: Finish all interior and exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
   1. Both sides and edges of plywood backboards for electrical and telecom equipment before installing equipment.
   2. Exposed surfaces of steel lintels and ledge angles.
   3. Prime surfaces to receive wall coverings.
   4. Mechanical and Electrical:
      a. In finished areas, paint all insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, mechanical equipment, and electrical equipment, unless otherwise indicated.
      b. Paint interior surfaces of air ducts that are visible through grilles and louvers with one coat of flat black paint to visible surfaces.
   5. Provide all labor, materials, equipment, and services required to furnish and apply the painting and staining materials.
      a. The term "paint" as used herein means coating systems materials, which includes primers, emulsions, enamels, stain, sealers and fillers, and other applied materials whether used as prime, intermediate or finish coats.
      b. Paint exposed surfaces whether or not colors are designated in any "schedule", except where natural finish of material is specifically noted as not to be painted. Where items or surfaces are not specifically mentioned, paint these same as adjacent similar materials or areas. If color or finish is not designated, AOR will select the colors.
      c. All surfaces that are left unfinished by the requirements of other Sections, whether specifically mentioned or not, shall be painted or finished as part of the work covered by this Section.

D. Do Not Paint or Finish the Following Items:
   1. Items fully factory-finished unless specifically so indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
   5. Floors, unless specifically so indicated.
   6. Glass.
   7. Concealed pipes, ducts, and conduits.

### 1.02 REFERENCE STANDARDS

A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.

B. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2016.

C. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials; 2016.

D. SSPC (PM1) - Good Painting Practice: SSPC Painting Manual, Vol. 1; Society for Protective Coatings; Fourth Edition.

E. SSPC-SP 2 - Hand Tool Cleaning; 1982 (Ed. 2004).

F. SSPC-SP 3 - Power Tool Cleaning; 1982 (Ed. 2004).

G. SSPC-SP 1 - Solvent Cleaning; 2015.

**1.03 SUBMITTALS**

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide complete list of all products to be used, with the following information for each:
   1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
   2. Cross-reference to specified paint system(s) product is to be used in; include description of each system.

C. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
   1. Where sheen is specified, submit samples in only that sheen.
   2. Where sheen is not specified, discuss sheen options with Architect before preparing samples, to eliminate sheens definitely not required.

D. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.
   2. Extra Paint and Coatings: 1 quart of each color and type; store where directed
   3. Label each container with color, type, texture, and room locations in addition to the manufacturer's label.

**1.04 QUALITY ASSURANCE**

A. Applicator Qualifications: Company specializing in performing the type of work specified with minimum three years experience.

B. In addition to complying with all pertinent codes and regulations, comply with "Standard (Type 1)" as defined by the Painting and Decorating Contractors of America in their "Modern Guide to Paint Specifications", current edition.

**1.05 DELIVERY, STORAGE, AND HANDLING**

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

**1.06 FIELD CONDITIONS**

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

A. National Account Vendor No. 25. Sherwin Williams.

B. Substitutions: Not permitted.

C. Approved manufacturers for isolated items named will be listed with the product.

D. All paints, stains, sealers, oils, thinners, turpentine or other materials required to accomplish the painting and finishing shall be Sherwin-Williams first quality materials.

## 2.02 MATERIALS COMPATIBILITY

A. Provide finish coats that are compatible with prime paints used. Review other Sections of these Specifications in which prime paints are to be provided to ensure compatibility of total coatings system for various substrates. Provide barrier coats over incompatible primers or remove and reprime. Notify AOR in writing of any anticipated problems using coating systems as specified with substrates primed by others.

B. All paint and stain materials and equipment shall be compatible in use; finish coats shall be compatible with prime coats; prime coats shall be compatible with the surface to be coated; all tools and equipment shall be compatible with the coating to be applied.

C. Thinners, when used, shall be only those thinners recommended for that purpose by the manufacturer of the materials to be thinned.

D. New paint or stain materials shall be compatible with the existing coatings on existing surfaces.

## 2.03 PAINTS AND COATINGS - GENERAL

A. Paints and Coatings: Ready mixed, unless intended to be a field-catalyzed coating.
   1. Provide paints and coatings of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
   2. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
   3. Supply each coating material in quantity required to complete entire project's work from a single production run.
   4. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.

B. Primers: As follows unless other primer is required or recommended by manufacturer of top coats; where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.

C. Volatile Organic Compound (VOC) Content:
   1. Provide coatings that comply with the most stringent requirements specified in the following:
      a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
   2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

D. Flammability: Comply with applicable code for surface burning characteristics.

E. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect from the manufacturer's full line.

F. Colors: As indicated on drawings
   1. In finished areas, finish pipes, ducts, conduit, and equipment the same color as the wall/ceiling they are mounted on/under.

## 2.04 ACCESSORY MATERIALS

A. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required to achieve the finishes specified whether specifically indicated or not; commercial quality.

B. Patching Material: Latex filler.

C. Fastener Head Cover Material: Latex filler.

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Do not begin application of coatings until substrates have been properly prepared.

B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

D. Test shop-applied primer for compatibility with subsequent cover materials.

E. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
   1. Gypsum Wallboard: 12 percent.
   2. Plaster and Stucco: 12 percent.
   3. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.
   4. Interior Wood: 15 percent, measured in accordance with ASTM D4442.
   5. Exterior Wood: 15 percent, measured in accordance with ASTM D4442.
   6. Concrete Floors and Traffic Surfaces: 8 percent.

### 3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to coating application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Remove or repair existing coatings that exhibit surface defects.

D. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.

E. Seal surfaces that might cause bleed through or staining of topcoat.

F. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

G. Plaster Surfaces to be Painted: Fill hairline cracks, small holes, and imperfections with latex patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high alkali surfaces.

H. Insulated Coverings to be Painted: Remove dirt, grease, and oil from canvas and cotton.

I. Concrete Floors and Traffic Surfaces to be Painted: Remove contamination, acid etch, and rinse floors with clear water. Verify required acid-alkali balance is achieved. Allow to dry.

J. Copper Surfaces to be Painted: Remove contamination by steam, high pressure water, or solvent washing. Apply vinyl etch primer immediately following cleaning.

K. Corroded Steel and Iron Surfaces to be Painted: Prepare using at least SSPC-SP 2 (hand tool cleaning) or SSPC-SP 3 (power tool cleaning) followed by SSPC-SP 1 (solvent cleaning).

L. Uncorroded Uncoated Steel and Iron Surfaces to be Painted: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Prime paint entire surface; spot prime after repairs.

M. Shop-Primed Steel Surfaces to be Finish Painted: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces.

N. Interior Wood Surfaces to Receive Transparent Finish: Wipe off dust and grit prior to sealing, seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after sealer has dried; sand lightly between coats. Prime concealed surfaces with gloss varnish reduced 25 percent with thinner.

O. Wood Doors to be Field-Finished: Seal wood door top and bottom edge surfaces with clear sealer.

P. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

**3.03 APPLICATION**

A. All materials shall be applied under adequate illumination, evenly spread, and smoothly flowed on with the proper type and size of brushes, roller covers, bucket grids, and spray equipment to avoid run, sags, holidays, brush marks, air bubbles, and excessive roller stipple.

B. Coverage and hide shall be complete. When color, stain, mark of any kind, dirt or undercoats show through the final schedule coat of paint to the surface, it shall be covered by additional coats until the paint film is of uniform finish, color, appearance and coverage at no additional cost to the Owner.

C. Finished areas shall be free from sags, runs, crawls, brush marks, and other defects.

D. Touch-up painting as required to provide smooth, even finish prior to final acceptance of work.

E. Defects: Sand and dust between coats to remove all defects visible to the unaided eye from a distance of five feet.

F. Color of undercoats: As recommended by Vendor 25.

G. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

H. Apply products in accordance with manufacturer's instructions.

I. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

J. Apply each coat to uniform appearance.

K. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.

L. Sand wood and metal surfaces lightly between coats to achieve required finish.

M. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

N. Wood to Receive Transparent Finishes: Tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.

O. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

**3.04 DRY FILM THICKNESS**

A. DFT represents Dried Film Thickness. It shall be checked on metal surfaces with a Nordson Mikrotest Dry Film Thickness Gauge. For other surfaces, a Tooke Dry Film Thickness Gauge shall be used. Surfaces may also be checked while surface is wet by using a Nordson or Sherwin-Williams Wet Film Gauge. Should an average of three readings out of five show film less than specified, additional materials should be applied until the surface has the proper amount of material.

**3.05 STENCILING RATED WALLS:**

A. Both sides of corridor partitions, smokestop partitions, horizontal exit partitions, exit enclosures, and fire walls shall be effectively and permanently identified with stenciling in a manner acceptable to the authority have jurisdiction and the AOR. Such identification shall be above the ceiling and in concealed spaces. Verify acceptable wording with AOR (Suggested wording: "Fire and Smoke Barrier - Protect All Openings"). Letters shall be 3" to 4" high and the phase shall be stenciled 15'-0" o.c. the length of the partition.

**3.06 CLEANING**

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

## 3.07 PROTECTION

A. Protect finished coatings until completion of project.

B. Touch-up damaged coatings after Substantial Completion.

## 3.08 SURFACE PREPARATION

A. SW 1 - Aluminum:
   1. Remove all oil, grease, dirt, oxide and other foreign material by cleaning per SSPC-SP1, Solvent Cleaning.

B. SW 3 - Block:
   1. Remove all loose mortar and foreign material. Surface must be free of laitance, concrete dust, dirt, form release agents, moisture curing membranes, loose cement, and hardeners. Concrete and mortar must be cured at least 30 days at 75 degrees. The pH of the surface shall be between 6 and 9, unless the products to used are designed to be used in high or low pH environments, such as Loxon. On tilt-up and poured-in-place concrete, commercial detergents and abrasive blasting may be necessary to prepare the surface. Fill bug holes, air pockets, and other voids with a patching compound such as ConSeal.

C. SW 8 - Drywall:
   1. Must be clean and dry. All nail heads must be set and spackled. Joints must be taped and covered with a joint compound. Spackled nail heads and tape joints must be sanded smooth and all dust removed prior to painting. Exterior surfaces must be spackled with exterior grade compounds.

D. SW 10 - Galvanized Metal:
   1. Allow to weather a minimum of 12 months prior to coating. Solvent clean per SSPC-SP1, then prime as required. When weathering is not possible or the surface has been treated with chromates or silicates, first Solvent Clean per SSPC-SP1 and apply a test area, priming as required. Allow the coating to dry at least one week before testing for adhesion per ASTM D3359. If adhesion is poor, Brush Blast per SSPC-SP7 is necessary to remove these treatments.

E. SW 12 - Previously Coated Surfaces:
   1. Maintenance painting will frequently not permit or require complete removal of all old coatings prior to repainting. However, all surface contamination such as oil, grease, loose paint, mill scale dirt, foreign matter, rust, mold, mildew, mortar, efflorescence, and sealers must be removed to assure sound bonding to the tightly adhering old paint. Glossy and/or smooth surfaces of old paint films must be clean and dull before repainting. Scuff sand and/or mechanically abrade to impart a slight surface profile that will promote adhesion of the subsequent coating. Spot prime any bare areas with an appropriate primer. Recognize that any surface preparation short of total removal of the system. Check for compatibility by applying a test patch of the recommended coating system, covering at least 2 to 3 square feet. Allow to dry one week before testing adhesion per ASTM D 3359. If the coating system is incompatible, complete removal is required.

F. Solvent Cleaning SSPC-SP 1:
   1. Solvent cleaning is a method for removing all visible oil, grease, soil, drawing and cutting compounds, and other soluble contaminants. Solvent cleaning does not remove rust or mill scale. Change rags and cleaning solution frequently so that deposits of oil and grease are not spread over additional areas in the cleaning process. Be sure to allow adequate ventilation.

G. Hand Tool Cleaning SSPC-SP 2:
   1. Hand tool Cleaning removes all loose mill scale, loose rust, and other detrimental foreign matter. It is not intended that adherent mill scale, rust, and paint be removed by this process. Before hand tool cleaning, remove visible oil, grease, soluble welding residues, and salts by the methods outlined in SSPC-SP1.

H. Power Tool Cleaning SSPC-SP3:

1. Power Tool Cleaning removes all loose mill scale, loose rust, and other detrimental foreign matter. It is not intended that adherent mill scale, rust, and paint be removed by this process. Mill scale, rust, and paint are considered adherent if they cannot be removed by lifting with a putty knife. Before power tool cleaning, remove visible oil, grease, soluble welding residues, and salts by the methods outlined in SSPC-SP 1 or other agreed upon methods.

I. SW 21 - Water Blasting:
   1. Removal of oil and grease, dirt, loose mill scale, and loose paint by water at pressures of 2,000 to 2,500 psi at a flow of 4-14 gallons/minute.

J. SW 22 - Stucco:
   1. Must be clean and free of any loose stucco. If recommended procedures for apply stucco are followed, and normal drying conditions prevail, the surface may be painted in 30 days. The pH of the surface shall be between 6-9.

K. SW 23 - Wood - Exterior:
   1. Must be clean and dry. Prime and paint as soon as possible. Knots and pitch streaks must be scraped, sanded, and spot primed before a full priming coat is applied. Patch all nail holes and imperfections with a wood filler or putty and sand smooth. Caulk shall be applied after priming.

L. SW 24 - Wood - Interior:
   1. All finishing lumber and flooring shall be stored in dry, warm rooms to prevent absorption of moisture, shrinkage, and roughening of the wood. All surfaces must be sanded smooth, with the grain, never across it. Surface blemishes must be corrected and the area cleaned of dust before coating.

M. Priming:
   1. The following require light gray primer (Color Prime No. 2):
      a. P-96: Hearty Orange SW6622
   2. The following require medium gray primer (Color Prime No. 5):
      a. P34: DSG Interior Hartford Green.
   3. All other areas require a White primer.

**3.09 PAINT AND FINISH SCHEDULE**

A. Interior
   1. Metal decking primed, galvanized steel or drywall above 17’-0” shall receive the following system as manufactured by Sherwin Williams:
      a. Surface Prep: SW 8, SW 10 or SW12
      b. Primer/Finish: 1-2 Coats Sherwin-Williams Waterborne Acrylic Flat Dryfall (B42W1 Series) @ 3-5 mils DFT per coat
      c. Note: Test Patch & Adhesion test on all decking per ASTM D3359 is required.
   2. Block walls shall receive the following system as manufactured by Sherwin Williams:
      a. Surface Prep: SW 3
      b. Primer: 1 Coat Sherwin-Williams Preprite Block Filler (B25 W25) @ 8 mils DFT
      c. Finish: 2 Coats Sherwin-Williams ProMar 200 Zero VOC Latex Eg-Shel (B20-2650 Series) @ 1-2 mils DFT per coat.
   3. Drywall, MDO or Aluminum shall receive the following system as manufactured by Sherwin Williams:
      a. Surface Prep: SW 8, SW 24, or SW 1
      b. Primer:1 Coat Sherwin-Williams ProMar 200 Zero VOC Latex Primer (B28W2600) @ 1.5-2 mils DFT
      c. (Refer to section 3.11M for colors requiring SW Color Primer Gray shading primer system.)
      d. Finish: 2 Coats Sherwin-Williams ProMar 200 Zero VOC Latex Eg-Shel(B20-2650 Series) @ 1-2 mils DFT per coat

4. Drywall, Gypsum Wallboard for Mall Entry and Mall Corridors where a textured finish is desired or to match existing EIFS shall receive the following system as manufactured by Sherwin Williams:
    a. Surface Prep: SW 8, SW 24, or SW 1
    b. Primer: 1 Coat Sherwin-Williams ProMar 200 Zero VOC Latex Primer (B28W2600) @ 1.5-2 mils DFT
    c. Finish: 1 Coat Sherwin-Williams Ultracrete Textured Masonry Topcoat Fine Finish (A44W801 Series) @ 50-80 sq. ft. per gallon tinted to “Caen Stone” SW 0028 *Not compliant for SCAQMD areas in CA (Optional): For added durability the Ultracrete may be topcoated with Sherwin-Williams ProMar 200 Interior Latex Semi-Gloss or Eg-Shel to increase the gloss level and help with washability.
5. Metal Doors and Jams, Pre-Primed, shall receive the following system as manufactured by Sherwin Williams:
    a. Surface Prep: SW 12
    b. Spot Prime: (As Needed) 1 coat Sherwin-Williams Pro-Industrial Pro-Cryl Universal Acrylic Primer(B66-310 series) @ 2.0-4.0 mils DFT
    c. Finish: 2 Coats Sherwin-Williams Pro Industrial Acrylic Semi-Gloss Enamel (B66-650 Series) @ 1.5-2 mils DFT per coat.
6. Ferrous Metal Hand Rails, Pre-Primed, shall receive the following system as manufactured by Sherwin Williams:
    a. Surface Prep: SW 12
    b. Spot Prime: 1 coat Sherwin-Williams Pro-Industrial Pro-Cryl Universal Acrylic (B66-310 series) @ 2.0-4.0 mils DFT
    c. Finish: 2 Coats Sherwin-Williams Pro Industrial Acrylic Semi-Gloss (B66-650 Series). Color SW7074 @ 2-4 mils DFT per coat
7. Ferrous Metal Columns - Pre Primed
    a. Surface Prep: SW 12
    b. Spot Prime: 1 coat Sherwin-Williams Pro-Industrial Pro-Cryl Universal Acrylic (B66-310 series) @ 2.0-4.0 mils DFT
    c. Finish: 2 Coats Sherwin-Williams Pro Industrial Acrylic Eg-Shel (B66-660 Series) @ 1.5 - 2 mils DFT per coat

B. Exterior
1. Ferrous Metal (Bare Steel) shall receive the following system as manufactured by Sherwin-Williams:
    a. Surface Prep: Power Tool Cleaning per SSPC-SP 3
    b. Primer: 1 coat Sherwin-Williams Pro-Industrial Pro-Cryl Universal Acrylic (B66-310 series) @ 2.0-4.0 mils DFT
    c. Finish: 2 Coats Sherwin-Williams Pro Industrial Acrylic Semi-Gloss (B66-650 Series) @ 2.5-3 mils DFT per coat
2. Non-Ferrous Metal (Aluminum) shall receive the following system as manufactured by Sherwin Williams:
    a. Surface Prep: SW 1
    b. Primer/Finish: 2 Coats Sherwin-Williams Duration Exterior Latex Satin Coating (K33 series) @ 2.5-3 mils DFT per coat
3. Non-Ferrous Metal (Galvanized) shall receive the following system as manufactured by Sherwin Williams:
    a. Surface Prep: SW 10
    b. Primer: 1 coat Sherwin-Williams Pro-Industrial Pro-Cryl Universal Acrylic (B66-310 series) @ 2.0-4.0 mils DFT
    c. Finish: 2 Coats Sherwin-Williams Duration Exterior Latex Satin Coating (K33 series) @ 2.5-3 mils DFT per coat
4. Block or Pre-Cast Concrete Painted shall receive the following system as manufactured by Sherwin Williams:
    a. Surface Prep: SW 3

b. Primer: 1 Coat Sherwin-Williams Loxon Block Surfacer (A24W200) @ 8 mils DFT
c. Finish: 2 Coats Sherwin-Williams Duration Exterior Latex Satin Coating (K33 Series) @ 2.5-3 mils DFT per coat.

5. Block or Pre-Cast Concrete Stained shall receive the following system as manufactured by Sherwin-Wiliams:
   a. Surface Prep: SW3
   b. Primer/Finish: 2 coats Sherwin-Williams Loxon Vertical Concrete Stain (A31 Series) @ proper spread rate (some heavy textured surfaces may require a 3rd coat for uniformity)
6. Black Pipe - Gas Lines shall receive the following system as manufactured by Sherwin Williams:
   a. Surface Prep: Power Tool Cleaning per SSPC-SP 3
   b. Primer: 1 Coat Sherwin-Williams Pro-Industrial Pro-Cryl Universal Acrylic (B66-310 series) @ 2.0-4.0 mils DFT
   c. Finish: 2 Coats Sherwin-Williams Pro Industrial Acrylic Gloss B66Y600 Series Color Safety Yellow @ 2.5-4 mils DFT per coat.
7. Wood shall receive the following system as manufactured by Sherwin Williams:
   a. Surface Prep: SW 23
   b. Primer/Finish: 2 Coats Sherwin-Williams Duration Exterior Latex Satin Coating (K33 Series) @ 2.5-3 mils DFT per coat (On new Cedar A100 oil primer (Y24) should be applied prior to duration)

C. Single Level (SLP) Interior Color Palette

1. P-9 Toilet Room
   Buckram Binding SW 0036
   ProMar 200 Zero VOC Latex Eg-shel

2. P-10 Throughout Store
   White Flour SW 7102
   ProMar 200 Zero VOC Latex Eg-Shel

3. P-30 Exterior Mall Entrance
   Frosty White SW 6196
   ProMar 200 Zero VOC Latex Eg-Shel

4. P-34 Throughout Store
   DSG Custom Interior Hartford Green
   ProMar 200 Zero VOC Latex Eg-Shel
   20T2654 *Single Gallon Formula

| Colorant | oz. | 32 | 64 | 128 |
|---|---|---|---|---|
| B1 Black | 2 | | | |
| L1 Blue | 2 | 28 | | |
| Y3 Deep Gold | | 60 | | |
| G2 New Green | | 8 | | |

   Color Prime No. 5.

5. P-67 Team Sports/Golf/Doors & Trim
   DSG Custom Brick 2 & 4
   ProMar 200 Zero VOC Latex Eg-Shel
   B20T2654 *Single Gallon Formula

| Colorant | oz. | 32 | 64 | 128 |
|---|---|---|---|---|
| W1 White | | 38 | 1 | |
| N1 RawUmber | 4 | 22 | 1 | |
| R2 Maroon | | 59 | | 1 |

| | | | |
|---|---|---|---|
| Y3 Deep Gold | 38 | | 1 |
| G2 New Green | 1 | | 1 |

6. P-69 Footwear
   Software SW 7074
   ProMar 200 Zero VOC Latex Eg-Shel

7. P-78 Footwear (FSFW)
   Iron Ore SW 7069
   ProMar 200 Zero VOC Latex Eg-Shel

8. P-84 Nike Shop: Color: DSG Custom PMS Cool Gray 11 Light
   Superpaint Interior Latex Satin, A87W1153-Deep Base
   *Single Gallon Formula

| CCE Colorant | oz. | 32 | 64 | 128 |
|---|---|---|---|---|
| W1 White | 4 | 39 | | 1 |
| B1 Black | 4 | 10 | | 1 |
| R2 Maroon | | 3 | | |
| Y3 Deep Gold | | 11 | 1 | 1 |

9. P-85 Nike Shop
   "Packaged" Black
   All Surface Enamel Satin/Low Sheen
   A41B201

10. P-89 Cash Wrap trim & Golf Simulator
    Color: Black Magic SW 6991
    ProMar 200 Zero VOC Latex Eg-Shel

11. P-91 Under Armour Shop
    Color: Nebulous White SW 7063
    ProMar 200 Zero VOC Latex Eg-Shel

12. P-94 Throughout / Portal Walls
    Color: DSG Custom Pegboard Silver
    ProMar 200 Zero VOC Latex Eg-Shel
    B20W2651 *Single Gallon Formula

| CCE Colorant | oz. | 32 | 64 | 128 |
|---|---|---|---|---|
| B1 Black | 2 | 19 | 1 | 1 |
| R2 Maroon | | 3 | 1 | |
| Y3 Deep Gold | | 21 | | |

13. P-103 2nd Floor Seasonal / Womens Fitting Rm
    Color: Anonymous SW 7046
    ProMar 200 Zero VOC Latex Eg-Shel

14. P-112 Columns & Walls Throughout
    Color: Amazing Gray SW 7044
    ProMar 200 Zero VOC Latex Eg-Shel

15. P-112A Underside of Deck
    Dryfall Custom Amazing Gray Dryfall
    Waterborne Acrylic Dryfall Flat
    B42W1 *5 Gallon Formula

| CCE Colorant | oz. | 32 | 64 | 128 |
|---|---|---|---|---|
| B1 Black | 2 | 53 | | |
| R2 Maroon | | 14 | | |
| Y3 Deep Gold | 2 | 49 | | |

16. P-114 Golf Band / Lodge Trim
    Color: Green Black SW 6994
    ProMar 200 Zero VOC Latex Eg-Shel

17. P-131 Team Sports
    Color: Bunglehouse Blue SW 0048
    ProMar 200 Zero VOC Latex Eg-Shel

18. P-132 Lodge
    Color: Thatch Brown SW 6145
    ProMar 200 Zero VOC Eg-Shel

19. P-133 Bikes & Fitness
    Color: Husky Orange SW 6636
    ProMar 200 Zero VOC Latex Eg-Shel

20. P-134 To match PL-51 in Golf
    Color: Jute Brown SW 6096
    ProMar 200 Zero VOC Latex Eg-Shel

21. P-150 Nike Fieldhouse
    Color: Summit Gray SW 7669
    ProMar 200 Zero VOC Latex Eg-Shel

22. P-154 Corridor Walls
    Color: Naturel SW 7542
    ProMar 200 Zero VOC Latex Eg-Shel

23. P-155 Golf
    Color: Westchester Gray SW 2849
    ProMar 200 Zero VOC Latex Eg-Shel
    8U

24. P-158 Golf Department (VE Stores)
    Color: Gale Force SW 7605
    ProMar 200 Zero VOC Latex Eg-Shel

25. P-159 Restrooms
    Color: Mega Greige SW 7031
    ProMar 200 Zero VOC Latex Eg-Shel

D. Two-Level (TLP) Interior Color Palette

1. P-9 Toilet Room
   Buckram Binding SW 0036
   ProMar 200 Zero VOC Latex Eg-shel

2. P-10 Throughout Store
   White Flour SW 7102
   ProMar 200 Zero VOC Latex Eg-Shel

3. P-30 Exterior Mall Entrance
   Frosty White SW 6196
   ProMar 200 Zero VOC Latex Eg-Shel

4. P-34 Throughout Store
   DSG Custom Interior Hartford Green
   ProMar 200 Zero VOC Latex Eg-Shel
   B20T2654 *Single Gallon Formula

| Colorant | oz. | 32 | 64 | 128 |
|---|---|---|---|---|
| B1 Black | 2 | | | |
| L1 Blue | 2 | 28 | | |
| Y3 Deep Gold | | 60 | | |
| G2 New Green | | 8 | | |

   Color Prime No. 5.

5. P-67 Team Sports/Golf/Doors & Trim
   DSG Custom Brick 2 & 4
   ProMar 200 Zero VOC Latex Eg-Shel
   B20T2654 *Single Gallon Formula

| Colorant | oz. | 32 | 64 | 128 |
|---|---|---|---|---|
| W1 White | | 38 | 1 | |
| N1 RawUmber | 4 | 22 | 1 | |
| R2 Maroon | | 59 | | 1 |
| Y3 Deep Gold | | 38 | 1 | |
| G2 New Green | | 1 | 1 | |

6. P-69 Footwear
   Software SW 7074
   ProMar 200 Zero VOC Latex Eg-Shel

7. P-78 Footwear (FSFW)
   Iron Ore SW 7069
   ProMar 200 Zero VOC Latex Eg-Shel

8. P-84 Nike Shop
   Color: DSG Custom PMS Cool Gray 11 Light
   Superpaint Interior Latex Satin,
   A87W1153-Deep Base *Single Gallon Formula

| CCE Colorant | oz. | 32 | 64 | 128 |
|---|---|---|---|---|
| W1 White | 4 | 39 | | 1 |
| B1 Black | 4 | 10 | | 1 |
| R2 Maroon | | 3 | | |
| Y3 Deep Gold | | 11 | 1 | 1 |

9. P-85 Nike Shop
   “Packaged” Black
   All Surface Enamel Satin/Low Sheen
   A41B201

10. P-89 Cash Wrap trim & Golf Simulator
    Color: Black Magic SW 6991
    ProMar 200 Zero VOC Latex Eg-Shel

11. P-91 Under Armour Shop
    Color: Nebulous White SW 7063
    ProMar 200 Zero VOC Latex Eg-Shel

12. P-92 Footwear;
    Color: Gray Matters SW 7066,
    ProMar 200 Zero VOC Latex Eg-Shel

13. P-93 First Floor;
    Color: Overt Green SW 6718,
    ProMar 200 Zero VOC Latex Eg-Shel

14. P-94 Throughout / Portal Walls
    Color: DSG Custom Pegboard Silver
    ProMar 200 Zero VOC Latex Eg-Shel
    B20W2651 *Single Gallon Formula

| CCE Colorant | oz. | 32 | 64 | 128 |
|---|---|---|---|---|
| B1 Black | 2 | 19 | 1 | 1 |
| R2 Maroon | | 3 | 1 | |
| Y3 Deep Gold | | 21 | | |

15. P-96 Paint
    Color: Hearty Orange SW 6622
    ProMar 200 Zero VOC Latex Eg-Shel
    Color Prime: No. 2

16. P-99 2nd Floor Perimeter;
    Color: Universal Khaki SW 6150,
    ProMar 200 Zero VOC Latex Eg-Shel

17. P-102 2nd Floor Camp / General
    Color: Smoky Topaz SW 6117
    ProMar 200 Zero VOC Latex Eg-Shel

18. P-103 2nd Floor Seasonal / Womens Fitting Rm
    Color: Anonymous SW 7046
    ProMar 200 Zero VOC Latex Eg-Shel

19. P-104 Under Armour Vendor Shop
    Color: Repose Gray SW 7015
    ProMar 200 Zero VOC Latex Eg-Shel

20. P-112 Columns & Walls Throughout
    Color: Amazing Gray SW 7044
    ProMar 200 Zero VOC Latex Eg-Shel

21. P-112A Underside of Deck
    Dryfall Custom Amazing Gray Dryfall
    Waterborne Acrylic Dryfall Flat
    B42W1 *5 Gallon Formula

| CCE Colorant | oz. | 32 | 64 | 128 |
|---|---|---|---|---|
| B1 Black | 2 | 53 | | |

R2 Maroon 14
Y3 Deep Gold 2 49

22. P-114 Golf Band / Lodge Trim
Color: Green Black SW 6994
ProMar 200 Zero VOC Latex Eg-Shel

23. P-119 Under Armour Mens Brick
Color: Gauntlet Gray SW 7019
ProMar 200 Zero VOC Latex Eg-Shel

24. P-131 Team Sports:
Color: Bunglehouse Blue SW 0048
ProMar 200 Zero VOC Latex Eg-Shel

25. P-132 Lodge
Color: Thatch Brown SW 6145
ProMar 200 Zero VOC Eg-Shel

26. P-133 Bikes & Fitness
Color: Husky Orange SW 6636
ProMar 200 Zero VOC Latex Eg-Shel

27. P-134 To match PL-51 in Golf
Color: Jute Brown SW 6096
ProMar 200 Zero VOC Latex Eg-Shel

28. P-140 Womens Studio
Color: Greek Villa SW 7551
ProMar 200 Zero VOC Latex Eg-Shel

29. P-149 Footwear
Color: Passive SW 7064
ProMar 200 Zero VOC Latex Eg-Shel

30. P-150 Nike Fieldhouse
Color: Summit Gray SW 7669
ProMar 200 Zero VOC Latex Eg-Shel

31. P-151 Nike Footwear;
Color: Dove Tail Gray SW 7018,
ProMar 200 Zero VOC Latex Eg-Shel

32. P-154 Corridor Walls
Color: Naturel SW 7542
ProMar 200 Zero VOC Latex Eg-Shel

33. P-155 Golf
Color: Westchester Gray SW 2849
ProMar 200 Zero VOC Latex Eg-Shel
8U

34. P-158 Golf Department (VE Stores)
Color: Gale Force SW 7605
ProMar 200 Zero VOC Latex Eg-Shel

35. P-159 Restrooms
    Color: Mega Greige SW 7031
    ProMar 200 Zero VOC Latex Eg-Shel

E. Combo Store (CS) Interior Color Palette

1. P-10 Throughout Store
   White Flour SW 7102
   ProMar 200 Zero VOC Latex Eg-Shel

2. P-21 Throughout Store
   Color: Black Magic SW 6991
   ProMar 200 Zero VOC Latex Eg-Shel

3. P-30 Exterior Mall Entrance
   Frosty White SW 6196
   ProMar 200 Zero VOC Latex Eg-Shel

4. P-34 Throughout Store
   DSG Custom Interior Hartford Green
   ProMar 200 Zero VOC Latex Eg-Shel
   B20T2654 *Single Gallon Formula

| Colorant | oz. | 32 | 64 | 128 |
|---|---|---|---|---|
| B1 Black | 2 | | | |
| L1 Blue | 2 | 28 | | |
| Y3 Deep Gold | | 60 | | |
| G2 New Green | | 8 | | |

   Color Prime No. 5.

5. P-67 Team Sports/Golf/Doors & Trim
   DSG Custom Brick 2 & 4
   ProMar 200 Zero VOC Latex Eg-Shel
   B20T2654 *Single Gallon Formula

| Colorant | oz. | 32 | 64 | 128 |
|---|---|---|---|---|
| W1 White | | 38 | 1 | |
| N1 RawUmber | 4 | 22 | 1 | |
| R2 Maroon | | 59 | | 1 |
| Y3 Deep Gold | | 38 | 1 | |
| G2 New Green | 1 | 1 | | |

6. P-69 Footwear
   Software SW 7074
   ProMar 200 Zero VOC Latex Eg-Shel

7. P-78 Footwear (FSFW)
   Iron Ore SW 7069
   ProMar 200 Zero VOC Latex Eg-Shel

8. P-84 Nike Shop
   Color: DSG Custom PMS Cool Gray 11 Light
   Superpaint Interior Latex Satin,
   A87W1153-Deep Base *Single Gallon Formula

| CCE Colorant | oz. | 32 | 64 | 128 |
|---|---|---|---|---|
| W1 White | 4 | 39 | | 1 |

| | | | | |
|---|---|---|---|---|
| B1 Black | 4 | 10 | | 1 |
| R2 Maroon | | 3 | | |
| Y3 Deep Gold | | 11 | 1 | 1 |

9. P-85 Nike Shop
   "Packaged" Black
   All Surface Enamel Satin/Low Sheen
   A41B201

10. P-89 Cash Wrap trim & Golf Simulator
    Color: Black Magic SW 6991
    ProMar 200 Zero VOC Latex Eg-Shel

11. P-91 Under Armour Shop
    Color: Nebulous White SW 7063
    ProMar 200 Zero VOC Latex Eg-Shel

12. P-94 Throughout / Portal Walls
    Color: DSG Custom Pegboard Silver
    ProMar 200 Zero VOC Latex Eg-Shel
    B20W2651 *Single Gallon Formula

| CCE Colorant | oz. | 32 | 64 | 128 |
|---|---|---|---|---|
| B1 Black | 2 | 19 | 1 | 1 |
| R2 Maroon | | 3 | 1 | |
| Y3 Deep Gold | | 21 | | |

13. P-103 Women's Fitting Rm
    Color: Anonymous SW 7046
    ProMar 200 Zero VOC Latex Eg-Shel

14. P-114 Golf Band / Lodge Trim
    Color: Green Black SW 6994
    ProMar 200 Zero VOC Latex Eg-Shel

15. P-120 Archery, Fishing, Camping, Lozier
    Retreat SW 6207
    ProMar 200 Zero VOC Latex Eg-Shel

16. P-123 Gun Shop Perimeter Wall
    Granite Peak SW 6250
    ProMar 200 Zero VOC Latex Eg-Shel

17. P-130 Back of House Archery
    Worldly Gray SW 7043
    ProMar 200 Zero VOC Latex Eg-Shel

18. P-131 Team Sports
    Color: Bunglehouse Blue SW 0048
    ProMar 200 Zero VOC Latex Eg-Shel

19. P-132 Lodge
    Color: Thatch Brown SW 6145
    ProMar 200 Zero VOC Eg-Shel

20. P-133 Bikes & Fitness

Color: Husky Orange SW 6636
ProMar 200 Zero VOC Latex Eg-Shel

21. P-134 To match PL-51 in Golf
    Color: Jute Brown SW 6096
    ProMar 200 Zero VOC Latex Eg-Shel

22. P-135 Restrooms
    Classic Light Buff SW 0050
    ProMar 200 Zero VOC Latex Eg-Shel

23. P-140 Womens Studio
    Color: Greek Villa SW 7551
    ProMar 200 Zero VOC Latex Eg-Shel

24. P-153 General Store Perimeter Ceiling
    Wool Skein SW 6148
    ProMar 200 Zero VOC Latex Eg-Shel

25. P-154 Corridor Walls
    Color: Naturel SW 7542
    ProMar 200 Zero VOC Latex Eg-Shel

26. P-155 Golf
    Color: Westchester Gray SW 2849
    ProMar 200 Zero VOC Latex Eg-Shel
    8U

27. P-159 Restrooms
    Color: Mega Greige SW 7031
    ProMar 200 Zero VOC Latex Eg-Shel

F. Triple Play (TP) Interior Color Palette

1. P-10 Throughout Store
   White Flour SW 7102
   ProMar 200 Zero VOC Latex Eg-Shel

2. P-21 Throughout Store
   Color: Black Magic SW 6991
   ProMar 200 Zero VOC Latex Eg-Shel

3. P-30 Exterior Mall Entrance
   Frosty White SW 6196
   ProMar 200 Zero VOC Latex Eg-Shel

4. P-34 Throughout Store
   DSG Custom Interior Hartford Green
   ProMar 200 Zero VOC Latex Eg-Shel
   B20T2654 *Single Gallon Formula

| Colorant | oz. | 32 | 64 | 128 |
|---|---|---|---|---|
| B1 Black | 2 | | | |
| L1 Blue | 2 | 28 | | |
| Y3 Deep Gold | | 60 | | |
| G2 New Green | | 8 | | |

Color Prime No. 5.

5. P-67 Team Sports/Golf/Doors & Trim
   DSG Custom Brick 2 & 4
   ProMar 200 Zero VOC Latex Eg-Shel
   B20T2654 *Single Gallon Formula

| Colorant | oz. | 32 | 64 | 128 |
|---|---|---|---|---|
| W1 White | | 38 | 1 | |
| N1 RawUmber | 4 | 22 | 1 | |
| R2 Maroon | | 59 | | 1 |
| Y3 Deep Gold | | 38 | 1 | |
| G2 New Green | 1 | 1 | | |

6. P-78 Footwear (FSFW)
   Iron Ore SW 7069
   ProMar 200 Zero VOC Latex Eg-Shel

7. P-84 Nike Shop
   Color: DSG Custom PMS Cool Gray 11 Light
   Superpaint Interior Latex Satin,
   A87W1153-Deep Base *Single Gallon Formula

| CCE Colorant | oz. | 32 | 64 | 128 |
|---|---|---|---|---|
| W1 White | 4 | 39 | | 1 |
| B1 Black | 4 | 10 | | 1 |
| R2 Maroon | | 3 | | |
| Y3 Deep Gold | | 11 | 1 | 1 |

8. P-85 Nike Shop
   “Packaged” Black
   All Surface Enamel Satin/Low Sheen
   A41B201

9. P-89 Cash Wrap trim & Golf Simulator
   Color: Black Magic SW 6991
   ProMar 200 Zero VOC Latex Eg-Shel

10. P-91 Under Armour Shop
    Color: Nebulous White SW 7063
    ProMar 200 Zero VOC Latex Eg-Shel

11. P-94 Throughout / Portal Walls
    Color: DSG Custom Pegboard Silver
    ProMar 200 Zero VOC Latex Eg-Shel
    B20W2651 *Single Gallon Formula

| CCE Colorant | oz. | 32 | 64 | 128 |
|---|---|---|---|---|
| B1 Black | 2 | 19 | 1 | 1 |
| R2 Maroon | | 3 | 1 | |
| Y3 Deep Gold | | 21 | | |

12. P-102 Camp
    Color: Smoky Topaz SW 6117
    ProMar 200 Zero VOC Latex Eg-Shel

13. P-103 Women’s Fitting Rm

Color: Anonymous SW 7046
ProMar 200 Zero VOC Latex Eg-Shel

14. P-105 Golf Equipment Focals
    Barcelona Beige SW 7530
    ProMar 200 Zero VOC Latex Eg-Shel

15. P-107 Golf Paint Stripe:
    Custom Golf Galaxy Navy
    ProMar 200 Zero VOC Latex Eg-Shel
    B20T2654 Ultra-Deep Base *Single Gallon Formula

| CCE Colorant | oz. | 32 | 64 | 128 |
|---|---|---|---|---|
| W1 White | | 6 | | |
| L1 Blue | 4 | 14 | | |
| R3 Magenta | 4 | 18 | | |
| Y1 Yellow | | 25 | | |

16. P-108 Hitting Range & Rooms
    Smokehouse SW 7040
    ProMar 200 Zero VOC Latex Eg-Shel

17. P-114 Golf Band / Lodge Trim
    Color: Green Black SW 6994
    ProMar 200 Zero VOC Latex Eg-Shel

18. P-120 Archery, Fishing, Camping, Lozier
    Retreat SW 6207
    ProMar 200 Zero VOC Latex Eg-Shel

19. P-123 Gun Shop Perimeter Wall
    Granite Peak SW 6250
    ProMar 200 Zero VOC Latex Eg-Shel

20. P-130 Back of House Archery
    Worldly Gray SW 7043
    ProMar 200 Zero VOC Latex Eg-Shel

21. P-131 Team Sports
    Color: Bunglehouse Blue SW 0048
    ProMar 200 Zero VOC Latex Eg-Shel

22. P-132 Lodge
    Color: Thatch Brown SW 6145
    ProMar 200 Zero VOC Eg-Shel

23. P-133 Bikes & Fitness
    Color: Husky Orange SW 6636
    ProMar 200 Zero VOC Latex Eg-Shel

24. P-134 To match PL-51 in Golf
    Color: Jute Brown SW 6096
    ProMar 200 Zero VOC Latex Eg-Shel

25. P-135 Restrooms
    Classic Light Buff SW 0050

ProMar 200 Zero VOC Latex Eg-Shel

26. P-140 Womens Studio
    Color: Greek Villa SW 7551
    ProMar 200 Zero VOC Latex Eg-Shel

27. P-153 General Store Perimeter Ceiling
    Wool Skein SW 6148
    ProMar 200 Zero VOC Latex Eg-Shel

28. P-154 Corridor Walls
    Color: Naturel SW 7542
    ProMar 200 Zero VOC Latex Eg-Shel

29. P-159 Restrooms
    Color: Mega Greige SW 7031
    ProMar 200 Zero VOC Latex Eg-Shel

G. Exterior Color Palette

1. P-50 Exterior Hartford Green
   Duration Exterior Latex Satin Ultradeep
   K33T154 *Single Gallon Formula

| Colorant | oz. | 32 | 64 | 128 |
|---|---|---|---|---|
| B1 Black | 2 | | | |
| L1 Blue | 2 | 48 | | |
| Y3 Deep Gold | 2 | 2 | | |

*For Store Front
P-50 Exterior Hartford Green
SherCryl HPA Semi-Gloss Ultradeep
B66T354 *Single Gallon Formula

| Colorant | oz. | 32 | 64 | 128 |
|---|---|---|---|---|
| W1 White | - | 10 | 1 | 1 |
| B1 Black | 4 | 10 | 1 | - |
| G2 Green | 2 | 62 | - | 1 |
| Y3 Deep Gold | - | 44 | 1 | 1 |

2. P-51 Caen Stone SW0028
   Duration Exterior Latex Satin, K33W151
   *Single Gallon Formula

| Colorant | oz. | 32 | 64 | 128 |
|---|---|---|---|---|
| Y3 Deep Gold | | 32 | 1 | |
| R2 Maroon | | 1 | | 1 |
| N1 Raw Umber | | 3 | 1 | 1 |

*For Areas Requiring a Concrete Stain
P-51 Caen Stone SW0028
Vertical Concrete Stain, A31W51
*Single Gallon Formula

| Colorant | oz. | 32 | 64 | 128 |
|---|---|---|---|---|
| Y3 Deep Gold | | | 26 | |

| | |
|---|---|
| R2 Maroon | 1 |
| N1 Raw Umber | 3 |

3. P-52 Beldon
   Duration Exterior Latex Satin Ultradeep
   K33T154 *Single Gallon Formula

| Colorant | oz. | 32 | 64 | 128 |
|---|---|---|---|---|
| W1 White | | 48 | | |
| N1 Raw Umber | 4 | 60 | | |
| R2 Maroon | 2 | 10 | | |
| Y3 Deep Gold | | 48 | | |
| G2 New Green | | 2 | | |

**END OF SECTION**

**SECTION 10 1600**

**PHOTO MURALS**

## PART 1 GENERAL

### 1.01 SCOPE:

A. Provide all of the labor, materials, equipment and services to furnish and install the photo murals.

B. See Drawings for sizes and exact quantities and locations.

C. For complete information, contact National Account Vendor No.8.

D. See Section 09 9000 Painting and Coatings, for subsurface cure time prior to installation of murals.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. Photo Murals in this section are to be provided by National Account Vendor #8.

### 2.02 DSG - DIRECT APPLIED SELF ADHESIVE VINYL

A. Pressure Sensitive Vinyl “Peel & Stick”.
   1. Level 5 Finish Dry Wall Required
   2. Priming & Painting
      a. Prime - 1 or 2 Coats - specified dry/recoat times
      b. Top Coat - Semi Gloss recommended - 1 or 2 coats - specified dry/recoat times
      c. Total - 3 -4 Coats (low knap - smooth finish)
      d. Some sanding of walls between coats may be required
   3. Wall to be free of voids, holidays, drips, and gouges.
   4. Painter must follow painting specifications of ASTM or USG specifications for coating of Level 5 Drywall Finishing
   5. Walls to be free of control joints

B. Prototypical Pressure Sensitive Graphics Usage
   1. Cashwrap Mural
   2. Self-Service Footwear focal
   3. Archery Lane

### 2.03 DSG - LIFT & DROP GRAPHIC PANELS

A. Digitally printed Ultraboard Rigid Panels
   1. I1 Lift / Drop Extruded Aluminum Framing System
   2. Can be installed over any current DSG Interior wall finish
   3. Can be installed on all DSG Fixture Types
   4. Prototypical Usage:
      a. Portal Graphics
      b. Perimeter Focal Graphics
      c. Golf Service Graphic
      d. Full-Service Footwear graphics

### 2.04 DSG - WALL COVERING

A. WC3- Two Level Women’s Studio Dressing Rooms
   1. Drywall Level 4
   2. Wallpaper Primer Required
      a. Roman 977
      b. Roman R35
      c. NO PAINT primer - no top coat
   3. WC5 - Power Aisle Dressing Rooms
      a. Raw MDF Walls

b. Wallpaper Primer required
    1) Roman R-35
c. NO PAINT primer - no top coat

4. WC6- Brick mural throughout
    a. Drywall Level 4
    b. Wallpaper Primer Required
        1) Roman 977
        2) Roman R35
    c. NO PAINT primer - no top coat
5. WC7- Two Level Studio white brick mural
    a. Drywall Level 4
    b. Wallpaper Primer Required
        1) Roman 977
        2) Roman R35
    c. NO PAINT primer - no top coat
6. CUSTOM GOLF MURAL
    a. Drywall Level 4
    b. Wallpaper Primer Required
        1) Roman 977
        2) Roman R35
    c. NO PAINT primer - no top coat

**2.05 DSG - ARCHERY LANE**

A. Prototypical Pressure Sensitive Graphics Usage
    1. Installed over Melamine boards
        a. No primer required

**PART 3 EXECUTION**

**3.01 EXAMINATION**

A. Verify that substrate surfaces are ready to receive work.

**3.02 INSTALLATION**

A. Install in accordance with manufacturer's instructions.

B. Install neatly, with horizontal edges level.

C. Protect from damage until Substantial Completion; repair or replace damaged items.

**END OF SECTION**

## SECTION 10 2600
## WALL AND DOOR PROTECTION

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Bumper rails.

B. Crash rails.

C. Corner guards.

D. Protective wall covering.

### 1.02 REFERENCE STANDARDS

A. ASTM D256 - Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics; 2010, with Editorial Revision (2015).

B. ASTM D543 - Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents; 2014.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.

D. ASTM F476 - Standard Test Methods for Security of Swinging Door Assemblies; 2014.

### 1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Indicate physical dimensions, features, wall mounting brackets with mounted measurements, anchorage details, and rough-in measurements.

### 1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver wall and door protection items in original, undamaged protective packaging. Label items to designate installation locations.

B. Protect work from moisture damage.

C. Protect work from UV light damage.

D. Store products in either horizontal or vertical position, in conformance with manufacturer's instructions.

### PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. Crash Rails and Corner Guards:
   1. Construction Specialties, Inc; SCR-48N, SSM-20N : www.c-sgroup.com.
   2. Substitutions: Not permitted.

B. Protective Wall Covering:
   1. Construction Specialties, Inc; : www.c-sgroup.com.
   2. Substitutions: Not permitted.

### 2.02 PERFORMANCE CRITERIA

A. Impact Strength: Unless otherwise noted, provide protection products and assemblies that have been successfully tested for conformance to applicable provisions of ASTM D256 and/or ASTM F476.

B. Chemical and Stain Resistance: Unless otherwise noted, provide protection products and assemblies with chemical and stain resistance conforming to applicable provisions of ASTM D543.

### 2.03 PRODUCT TYPES

A. Crash Rails: Factory- or shop-fabricated, with preformed end caps and internal and external corners:

1. Material: Polyethylene terephthalate (PET or PETG); PVC-free, color as indicated.
2. Surface Burning Characteristics: Provide assemblies with flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
3. Mounting: Surface.
4. Return rail to wall.

B. Corner Guards - Surface Mounted:
1. Material: Polyethylene terephthalate (PET or PETG); PVC-free with full height extruded aluminum retainer.
2. Surface Burning Characteristics: Provide assemblies with flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
3. Width of Wings: 2 inches.
4. Corner: Radiused.
5. Color: As indicated.
6. Length: One piece.
7. Preformed end caps.

C. Protective Wall Covering:
1. Material: Polyethylene terephthalate (PET or PETG); PVC and PBTs-free.
2. Thickness: 0.040 inch.
3. Surface Burning Characteristics: Provide assemblies with flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
4. Color: As indicated on drawings.
5. Texture: Suede.
6. Accessories: Provide manufacturer's standard color-matched trim and moldings.
7. Mounting: Adhesive.

### 2.04 FABRICATION

A. Fabricate components with tight joints, corners and seams.

B. Form end trim closure by capping and finishing smooth.

### 2.05 SOURCE QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for additional requirements.

B. Provide wall and door protection systems of each type from a single source and manufacturer.

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verify that rough openings, concealed blocking, and anchors are correctly sized and located.

B. Verify that field measurements are as indicated on drawings.

C. Verify that substrate surfaces for adhered items are clean and smooth.

### 3.02 INSTALLATION

A. Install components in accordance with manufacturer's instructions, level and plumb, secured rigidly in position to supporting construction.

B. Position top of bumper rail 48 inches from finished floor.

C. Position corner guard 4 inches above finished floor to 42 inches high.

D. Terminate rails 1 inch short of door openings and intersecting walls.

E. Position protective wall covering no less than 1 inch above finished floor to allow for floor level variation.
1. Wainscot Installation: Establish a level line at the specified height for entire length of run. Install by aligning top of edge of covering with this line.

2. Apply adhesive with 1/8 inch V-notch trowel to an area of wall surface that can be completed within cure time of the adhesive.
3. Install trim pieces as required for a complete installation. Allow tolerance for thermal movement.
4. At joints indicated to be caulked, allow for a minimum 1/16 inch wide gap between edges of sheets. Gaps are required to be of consistent width throughout the project.
5. Use a roller to ensure maximum contact with adhesive.
6. At inside and outside corners cut covering sheets to facilitate installation of trim pieces or corner guards.

**3.03 TOLERANCES**

A. Maximum Variation From Required Height: 1/4 inch.

B. Maximum Variation From Level or Plane For Visible Length: 1/4 inch.

**3.04 CLEANING**

A. Clean wall and door protection items of excess adhesive, dust, dirt, and other contaminants.

**END OF SECTION**

## SECTION 10 4400
## FIRE PROTECTION SPECIALTIES

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

A. Fire extinguishers.

B. Accessories.

#### 1.02 REFERENCE STANDARDS

A. FM (AG) - FM Approval Guide; current edition.

B. NFPA 10 - Standard for Portable Fire Extinguishers; 2013.

C. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.

#### 1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide extinguisher operational features.

C. Shop Drawings: Indicate locations of individual fire extinquishers.

#### 1.04 FIELD CONDITIONS

A. Do not install extinguishers when ambient temperature may cause freezing of extinguisher ingredients.

### PART 2 PRODUCTS

#### 2.01 FIRE EXTINGUISHERS

A. Fire Extinguishers - General: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.
   1. Provide extinguishers labeled by UL (DIR) or FM (AG) for purpose specified and as indicated.

B. Multipurpose Dry Chemical Type Fire Extinguishers: Carbon steel tank, with pressure gage.
   1. Class: A:B:C type.
   2. Size: 5 pound minimum.
   3. Finish: Baked polyester powder coat, red color.
   4. Temperature range: Minus 40 degrees F to 120 degrees F.

#### 2.02 ACCESSORIES

A. Extinguisher Brackets: Formed steel, chrome-plated.

B. Graphic Identification: Fire Extinguisher.

### PART 3 EXECUTION

#### 3.01 EXAMINATION

A. Verify existing conditions before starting work.

#### 3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install one (1) extinguisher per 3,000 s.f. floor area and not more than 75' travel distance from any point to an extinguisher.

C. Secure rigidly in place.

D. Place extinguishers on wall brackets, unless noted otherwise.

E. Final size, location and quantity shall be confirmed by the authority having jurisdiction.

**END OF SECTION**

**SECTION 21 1000**

**FIRE PROTECTION**

## PART 1 GENERAL

### 1.01 REFERENCE

A. Drawings and General Provisions of contract, including General and Supplementary Conditions and Division 1 specification sections, apply to work of this section.

B. The requirements of this Section shall govern all Mechanical Division work for this project. Bidders are referred to in this section as "Mechanical Contractors" and all provisions apply to each contractor and their subcontractors.

### 1.02 WORK INCLUDED

A. Modify existing fire protection system as required to conform to new partitions and new ceiling layout to provide complete sprinkler system.

B. Provide automatic sprinkler protection for project, per all NFPA requirements.

C. Prepare hydraulic calculations, shop drawings, obtain permits and approvals from governing authorities and owners insurance underwriter.

D. Provide spare sprinkler heads and tools in cabinet, hydraulic nameplates and other items required by NFPA standards.

E. Perform flow test of fire water supply main and use in preparation of hydraulic calculations.

F. System shall comply with State, Local and Fire Marshal requirements.

G. Provide other items as required for complete system.

### 1.03 RELATED WORK SPECIFIED ELSEWHERE

A. Refer to Section 21 0500.

### 1.04 PERMITS AND FEES

A. Permits required for fire protection installation shall be obtained and paid for by this contractor. Submittals and calculations shall be prepared by a State licensed fire protection designer. Installations shall be completed by a State certified fire protection tradesman and contractor.

### 1.05 CODES AND STANDARDS

A. Conform to all applicable fire and building code regulations, including State Building Code, Local Building Code and Fire Marshal requirements.

B. Conform to NFPA standards.

C. Comply with owner's insurance underwriter requirements for the project.

### 1.06 COORDINATION AND PIPE LOCATIONS

A. The drawings are essentially diagrammatic to the extent that offsets, bends, special fittings and exact locations are not indicated.

B. Attention is called to the limited space available for the installation of mechanical services. It is essential for the coordination of all trades that this contractor be responsible for confirming the location and elevations of fire protection equipment at the job site to avoid encroaching upon the space needed and allocated for another trade. If system piping interferes with the work of another trade, it shall be relocated by this contractor at no additional cost to the owner.

C. Sprinkler mains and branch lines, where concealed above ceilings, shall be installed tight to the underside of structural framing with drop nipples to sprinkler heads located in the center of ceiling tiles. No horizontal piping is permitted immediately above the light fixtures, in equipment service clearance areas, above electrical panels or electrical equipment.

D. Drawings are not intended to be scaled for rough-in measurement or to serve as shop drawings, installation drawings or sleeve drawings. "Working Plans" for these purposes shall be prepared by this contractor.

**1.07 SUBMITTALS**

A. Submittals are required as follows:

1. Sprinkler heads and escutcheons.
2. Alarm check valves and complete trim.
3. Hydraulic calculations and sprinkler shop drawings.

**1.08 SUBMITTAL DRAWINGS**

A. Contractor shall take field measurements and prepare submittal shop drawings for all standpipe and sprinkler systems on the project. Drawings shall be 1/8" = 1'0" scale drawings and shall show all ductwork, major piping and light fixtures to verify coordination with the work of other trades. Provide sections of the building at critical locations to indicate locations of all piping, equipment and ductwork.

B. Prepare hydraulic calculations based upon site flow test. Submittal shall include water supply curve, indicating system supply and demand, including hose stream allowance. Calculations shall include a minimum 10 psi or a 10% safety factor between available supply and system demand pressure and flow.

C. Provide additional heads as necessary to accommodate the building architecture. The FP1.0 Drawing shows some sprinkler head locations. This contractor is responsible to add heads to comply with NFPA 13 spacing requirements.

**1.09 TESTS**

A. Conduct pressure tests and flush all above and below grade piping as the installation progresses, as stipulated by NFPA Standards and authorities having jurisdiction.

B. All tests shall be witnessed by the owner along with all interested agencies and the Fire Marshal's office.

C. This contractor shall complete a flow test of the project water supply main prior to preparing hydraulic calculations and use this information in preparation of calculations for this project. If the system cannot be hydraulically confirmed to work based on the flow test information, this contractor shall design and install a centrifugal fire pump system, per NFPA 20 requirements to augment the available water pressure.

D. Provide blind flange connections as required to test sections of the system during the various phases of this construction. Arrange for all system shutdowns and refill and activate

portions of the system in completed sections of the building as new connections are made and other areas of the building are finished.

E. All defects made evident by the tests shall be properly repaired by the contractor. Leaks shall be repaired only by means of tightening or replacing the fitting and not any caulking method.

F. After the completion of testing and adjustments, contractor shall furnish three (3) copies each of signed certificates of approval and acceptance of all parts of the systems, from all authorities having jurisdiction and insurance underwriters.

**1.10 CERTIFICATION**

A. Contractor shall provide owner with three (3) copies of the following for each phase of the project:

1. Flushing certificate.
2. Hydrostatic pressure test certificate.
3. Street main flow test.
4. Record drawings.

**1.11 SHUTDOWN**

A. Arrange for shutdown of existing system with owner's representative and insurance underwriter. Shut down existing system only as required to make new connection and refill existing system upon completion of this work. Maintain service to all occupied areas of the building throughout this project.

**1.12 TEMPORARY FIRE PROTECTION AND PRECAUTION**

A. During the construction period, provide temporary fire extinguisher facilities as required by the local Fire Marshal including portable extinguishers, and small hose streams.

**1.13 SPRINKLER DESIGN BASIS**

A. This contractor shall complete a flow test for the project at the time of maximum demand on the water supply system to verify the above test results. The contractor's test shall be used as the basis for preparing the hydraulic calculations for the project.

B. Pipe sizing and layout for the sprinkler system is the contractor's responsibility.

C. Sprinkler design coverage for the project shall be as follows:

1. Design basis shall be per NFPA 13 requirements.
2. Automatic sprinkler system shall utilize concealed piping and flush fully recessed type sprinkler heads in areas with a ceiling. Exposed piping and heads will only be permitted in rooms without ceiling.
3. No wet sprinkler piping will be permitted in a cold space, inside the building insulation or in locations subject to freezing. Clearly indicate pipe locations on submittal drawings.

D. The sprinkler system shall be hydraulically balanced to provide the required minimum density over the most hydraulically remote area and a minimum of 10 psi or 10% safety factor.

E. Calculations shall include the sprinkler system demand and hose stream requirements.

F. A riser nameplate shall be permanently affixed to each calculated system riser, providing hydraulic data in accordance with N.F.P.A. requirements.

## PART 2 PRODUCTS

### 2.01 MATERIALS AND EQUIPMENT

A. All materials and equipment shall be UL listed, IRI and FM approved for fire protection systems.

B. Pipe and Fittings:

Above Grade

1. Wet system piping inside building shall be steel, copper, according to Chapter 6 of NFPA 13. All pipe joining solders and fluxes shall be rated by the manufacturer for the intended service and tested by Copper Development Association. Plastic piping is not approved.
2. Piping shall be joined with threaded fittings, flanges or by mechanical grooved couplings.
3. Groove joining shall be done by an approved combination of couplings, gaskets and grooves. Grooves on pipe shall be dimensionally compatible with fittings and certified by the coupling manufacturer.
4. Pipe and tube used in sprinkler and standpipe system shall be designed to withstand a working pressure of not less than 200 psi.

C. Valves Above Grade:

1. Shut-off valves in the fire system shall be UL/FM approved O.S.&Y. gate valves or butterfly valves, 250 pounds WWP.
2. Check valves in fire lines and sprinkler lines shall be UL/FM iron body bronze mounted checks, flanged ends, 250 pounds WWP.
3. All system shut-off valves shall be supervised and supplied with tamper switches.
4. Alarm check valves shall be U.L. listed with pressure gages, water motor alarm gong, test valves, drains and trim. An electric flow alarm gong shall be provided by electrical contractor through the building fire alarm system.

D. Sprinkler Heads:

1. Sprinkler Heads: Heads shall be UL listed, FM approved and rated in accordance with NFPA 13, with a minimum rating of 165° F; higher temperature rated sprinkler heads shall be provided when required by NFPA 13 due to space conditions.
2. Sprinkler head types shall be as indicated on Drawing FP1.0.
3. Provide a stock of spare heads of each type and rating of not less than the quantities required by NFPA-13. Provide a metal cabinet appropriately labeled for head storage with special sprinkler tools.
4. Manufacturers: Viking or equal, Tyco or Reliable Automatic Sprinkler Company.

### 2.02 TAMPER SWITCHES

A. Description:

1. Furnished and installed by fire protection system contractor.
2. UL listed monitor (supervisory) switches shall be installed on gate valves in the sprinkler piping as required by NFPA.
3. Switches shall be so mounted as not to interfere with the normal operation within two (2) revolutions of the valve stem, or when the stem has moved no more than one-fifth (1/5) of the distance from its normal position. Failure of the switch shall activate trouble alarm circuit.
4. Mechanism shall be contained in a weatherproof metal housing, having a 3/4" tapped

conduit entrance and facilities for its attachment to the valve. Switch housing shall be furnished in red enamel.

5. Switch mechanism shall have a minimum rated capacity of one (1) amp, 125 volt AC; 0.25 amp, 24 volt DC.
6. Entire assembly shall be tamper proof arranged to cause a switch operation if the housing cover is removed or if the unit is removed from its mounting.

B. Location: Furnish on all fire protection system supply valves, including site post indicator valve.

C. Manufacturers: Potter Electric, Viking or equal.

**2.03 FLOW SWITCHES**

A. Description:

1. Furnished and installed by fire protection system contractor.
2. UL listed/FM approved water flow devices shall be clamp-on type with metal pipe saddle to which is attached a thin flexible Teflon or Monel "K" paddle for sensing water movement.
3. Device contains terminal blocks for wiring it for either open or closed circuit operation.
4. To prevent false alarms due to water pressure surges, it shall contain a field adjustable time delay (0 to 60 seconds).
5. Device shall be dust proof and moisture-proof with a metal bellows and seal for positive water seal.
6. Contact ratings: 7.0 amps at 125-250 volts AC.
7. Device contains a 3/4" tapped electrical conduit connection.

B. Manufacturers: Potter Electric, Viking or equal.

**2.04 PRESSURE GAGES**

A. Provide 3-1/2" diameter pressure gages with a 0 to 200# range calibrated to +/- psi and gage cock. Case shall be moisture proof chrome plated with bronze works and recalibration adjustment screw. Cover shall be screw ring with beveled glass seated against a gasket.

B. Gage shall be manufactured by Potter-Roemer or equivalent by Allen Co., or Elkhart.

**PART 3 EXECUTION**

**3.01** The contractor shall furnish all labor, necessary construction equipment, materials necessary for the complete installation of the fire protection system as shown on the drawings. All work shall be in strict compliance with all governing State and local code requirements, in full conformity with the best current trade practices and subject to approval of the Architect or his representative.

**3.02** All work details not covered by these specifications shall be governed by the requirements of the latest edition of NFPA No. 13, 20, 24, 25 & 291.

**3.03** Piping shall be screwed, welded, flanged or joined with mechanical fittings. Acceptable mechanical fittings include Aeroquip or Victaulic as listed by Factory Mutual. All welding shall be performed in conformance with NFPA No. 13.

**3.04** Isolate connections between pipe fittings, hangers of dissimilar metal against direct contact. Use dielectric insulating flanges and unions.

**3.05** Support all sprinkler piping, risers, etc., as specified in NFPA No. 13.

**3.06** Flushing Connections - 4" long nipple and cap shall be provided at ends of all cross mains.

**3.07** Reducers shall be eccentric and installed in piping so that piping can be drained.

**3.08** All drain lines including riser drain, alarm drain, inspector's test drain, low points, etc., shall terminate with turned down ells on building exterior and shall be so located that discharged water will not interfere with normal conduct of business in building. Concrete splash guards shall be provided at grade level beneath all outside drains to minimize soil erosion. Install a dedicated test riser and discharge to an owner and architect approved location. Do not discharge to janitors sinks or floor drains.

**3.09** Provide inspector's test valve and nozzle at furthest point of each riser system and discharge through exterior wall at a location approved by the architect. Install identification nametag on valve.

**3.10** Provide sleeves for all pipes passing through fire walls and partitions. Set sleeves before floors and walls are poured. Pack sleeves with fireproofing materials. Provide chrome plated escutcheons where exposed pipes pass through walls or floors.

**3.11** Copper solder joints shall have pipe or tubing ends reamed to full inside diameter after cutting. Exterior of joint must be smooth. Clean with steel wool. All joints shall be made with non-toxic high melting point solder.

**3.12** Make screwed joints with pipe compound applied to male threads only. All cut ends of the pipe shall be carefully reamed to full size. UL/FM approved flexible couplings are permitted on all feed mains and standpipe risers.

**3.13** Valves shall not be installed with stems in less than a horizontal position. All fire valves shall be provided with tamper switches.

**3.14** Locations of all sprinkler heads and piping shall be coordinated with architectural design and centered with the ceiling grid pattern, lighting fixtures, columns, HVAC diffusers, all mechanical equipment and other possible obstructions. Any piping which is installed at locations which prevents adequate access for the installation and maintenance of other systems shall be removed and rerouted as directed by the Project Engineer, at no cost to the Owner.

**3.15** Drop nipples shall be field cut and coordinated with ceiling height. All drops shall include double elbows to permit exact centering in ceiling tiles. All sprinkler mains shall be installed tight to the underside of each structural floor or roof system. Piping shall not be suspended immediately above the ceiling grid. UL/FM approved flexible drop pipes are permitted to connect ceiling-mounted sprinkler heads to sprinkler branch lines.

**3.16** Install shut-off valve with supervised tamper switch on all water supply shut-off valves.

**3.17 <u>Adjusting and Cleaning</u>**

A. Disinfection of Water Mains: Flush and disinfect in accordance with AWWA C601 "Standards for Disinfecting Water Mains."

B. Cleaning Piping: Clear interior of piping of dirt and other superfluous material as work progresses. Maintain swab or drag line and pull past each joint as it is completed. Place plugs in ends of uncompleted pipe at end of day or whenever work stops.

**3.18** No piping shall be installed at locations subject to freezing. All wet piping must be installed in heated air plenum spaces below dry wall and ceiling insulation which separates cold spaces from heated plenum areas.

**3.19 <u>Protection</u>**

Contractor shall be responsible for providing and maintaining adequate precautions and safeguards

related to this work during all phases of construction.

**3.20** No piping shall be installed over electrical panels or electrical equipment, except for piping serving only sprinkler heads in equipment room.

END OF SECTION

## SECTION 23 0100
## BASIC MECHANICAL REQUIREMENTS

### PART 1 - GENERAL

### 1.01 SECTION INCLUDES

A. Basic Mechanical Requirements specifically applicable to Division 23 Sections, in addition to Division 1 - General Requirements.

### 1.02 REFERENCES

A. American National Standards Institute (ANSI)

B. American Society of Mechanical Engineers (ASME)

C. American Water Work Association (AWWA)

D. American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE)

E. American Refrigeration Institute (ARI)

F. American Society for Testing and Materials (ASTM)

G. National Fire Protection Association (NFPA)

H. Sheet Metal and Air Conditioning Contractors National Association (SMACNA)

I. National Electrical Manufacturer's Association (NEMA)

J. Underwriter's Laboratories (UL)

K. Manufacturer's Standardization Society of the Valve and Fitting Industry (MSS)

L. American Gas Association (AGA)

M. Factory Mutual (FM)

N. Industrial Risk Insurers (IRI)

O. Insurers Service Organization (ISO)

P. Plumbing & Drainage Institute (PDI)

### 1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Proposed Products List: Include Products specified in Division 23.

C. Submit shop drawings and product data grouped to include complete submittals of related systems, products, and accessories in a single submittal.

D. Mark dimensions and values in units to match those specified.

### 1.04 REGULATORY REQUIREMENTS

A. Refer to plan title sheet.

B. Conform to all applicable codes, government regulations, utility company requirements and national electrical code.

C. Obtain permits, and request inspections from authority having jurisdiction.

### 1.05 PROJECT/SITE CONDITIONS

A. Install Work in locations shown on Drawings, unless prevented by Project conditions.

B. Prepare drawings showing proposed rearrangement of Work to meet Project conditions, including changes to Work specified in other Sections. Obtain permission of Architect/Engineer before proceeding.

### 1.06 TRANSPORTATION AND HANDLING

A. Transport and handle Products in accordance with manufacturer's instructions.

B. Promptly inspect shipments to ensure that Products comply with requirements, quantities are correct, and Products are undamaged.

C. Provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.

**1.07 STORAGE AND PROTECTION**

A. Store and protect Products in accordance with manufacturers' instructions, with seals and labels intact and legible.

B. Store sensitive Products in weather tight, climate controlled enclosures.

C. For exterior storage of fabricated Products, place on sloped supports, above ground.

D. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.

**PART 2 - PRODUCTS**

**2.01 NOT USED**

**PART 3 - EXECUTION**

**3.01 INSTALLATION REQUIREMENTS**

A. Work shall be installed in full accordance with all applicable codes, rules and regulations of public authorities and/or utilities. Included shall be N.F.P.A., OSHA, State and local Building Codes.

B. Locations of piping, equipment, ducts, etc., as shown the drawings are diagrammatic; indicated positions shall be followed as closely as possible, exact locations shall be subject to building construction and interferences with other work. Difficulties preventing the installation of any part of work as indicated shall be called to the attention of the Architect. Architect shall determine locations and changes and this contractor shall install the work accordingly. Architect reserves right to make minor changes in location of any part of the work up to the time of roughing-in without additional cost.

C. All materials and equipment shall be installed in a neat and workmanlike manner by competent specialists for each subtrade. The installation of any materials and equipment not meeting these standards, in the sole judgment of the architect, will require removal and reinstallation at no additional cost to the Owner.

D. Install all items under this contract in accordance with best engineering practice and in conformity with manufacturer's printed instructions.

E. Take all measurements and determine all elevations at the building prior to fabrication or rough-in.

F. All mechanical system components shall be routed tight to underside of structure and through joists or trusses where possible. Coordinate installation to preserve headroom, equipment access, and architectural clearances for finishes, including ceiling heights. Coordinate with all other trades and do not conflict with the architectural requirements for the finished construction. Provide offsets where required to coordinate with other trades.

G. Coordinate electrical and plumbing characteristics of all mechanical equipment with electrical and plumbing contractors prior to ordering of equipment. No additional payment will be made for lack of contractor coordination of plumbing and electrical characteristics.

H. Contractors bidding this project shall have prior experience working in this jurisdiction and must list on bid form any local requirements that are not shown on the drawings. Submission of a bid shall be evidence that the contractor's bid includes all jurisdictional requirements.

**END OF SECTION**

## SECTION 23 0553
## IDENTIFICATION FOR HVAC EQUIPMENT

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Nameplates.

B. Tags.

C. Stencils.

### 1.02 RELATED REQUIREMENTS

A. Section 09 9000 - Painting and Coating: Identification painting.

### 1.03 REFERENCE STANDARDS

A. ASME A13.1 - Scheme for the Identification of Piping Systems; 2015.

B. ASTM D709 - Standard Specification for Laminated Thermosetting Materials; 2017.

### 1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide manufacturers catalog literature for each product required.

### PART 2 PRODUCTS

### 2.01 NAMEPLATES

A. Manufacturers:
   1. Advanced Graphic Engraving, LLC:
   2. Brimar Industries, Inc:
   3. Kolbi Pipe Marker Co:
   4. Seton Identification Products:

B. Letter Color: Black.

C. Background Color: Contrasting light color background.

D. Plastic: Conform to ASTM D709.

### 2.02 TAGS

A. Manufacturers:
   1. Advanced Graphic Engraving:
   2. Brady Corporation:
   3. Brimar Industries, Inc:
   4. Kolbi Pipe Marker Co:
   5. Seton Identification Products:

B. Plastic Tags: Laminated three-layer plastic with engraved black letters on light contrasting background color. Tag size minimum 1-1/2 inch (40 mm) diameter.

### 2.03 STENCILS

A. Manufacturers:
   1. Brady Corporation
   2. Kolbi Pipe Marker Co:
   3. Seton Identification Products:

B. Stencils: With clean cut symbols and letters of following size:
   1. Ductwork and Equipment: 2-1/2 inch (65 mm) high letters.

C. Stencil Paint: As specified in Section 09 9000, semi-gloss enamel, colors conforming to ASME A13.1.

## PART 3 EXECUTION

### 3.01 PREPARATION

A. Degrease and clean surfaces to receive adhesive for identification materials.

B. Prepare surfaces in accordance with Section 09 9000 for stencil painting.

### 3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.

C. Install tags with corrosion resistant chain.

D. Apply stencil painting in accordance with Section 09 9000.

E. Install ductwork with stencilled painting. Identify with rooftop unit identification number and area served. Locate identification at rooftop unit, at each side of penetration of structure or enclosure, and at each obstruction.

**END OF SECTION**

## SECTION 23 0593

## TESTING, ADJUSTING, AND BALANCING FOR HVAC

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Testing, adjustment, and balancing of air systems.

B. Measurement of final operating condition of HVAC systems.

### 1.02 REFERENCE STANDARDS

A. AABC (NSTSB) - AABC National Standards for Total System Balance, 7th Edition; 2016.

B. ASHRAE Std 111 - Measurement, Testing, Adjusting, and Balancing of Building HVAC Systems; 2008.

C. NEBB (TAB) - Procedural Standards for Testing Adjusting and Balancing of Environmental Systems; 2015, Eighth Edition.

D. SMACNA (TAB) - HVAC Systems Testing, Adjusting and Balancing; 2002.

### 1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. TAB Plan: Submit a written plan indicating the testing, adjusting, and balancing standard to be followed and the specific approach for each system and component.
   1. Include at least the following in the plan:
      a. List of all air flow, sound level, system capacity and efficiency measurements to be performed and a description of specific test procedures, parameters, formulas to be used.
      b. Copy of field checkout sheets and logs to be used, listing each piece of equipment to be tested, adjusted and balanced with the data cells to be gathered for each.
      c. Identification and types of measurement instruments to be used and their most recent calibration date.
      d. Discussion of what notations and markings will be made on the duct and piping drawings during the process.
      e. Final test report forms to be used.
      f. Expected problems and solutions, etc.
      g. Confirmation of understanding of the outside air ventilation criteria under all conditions.
      h. Method of verifying and setting minimum outside air flow rate will be verified and set and for what level (total building, zone, etc.).
      i. Procedures for formal deficiency reports, including scope, frequency and distribution.

C. Final Report: Indicate deficiencies in systems that would prevent proper testing, adjusting, and balancing of systems and equipment to achieve specified performance.
   1. Revise TAB plan to reflect actual procedures and submit as part of final report.
   2. Submit draft copies of report for review prior to final acceptance of Project. Provide final copies for Architect and for inclusion in operating and maintenance manuals.
   3. Provide reports in soft cover, letter size, 3-ring binder manuals, complete with index page and indexing tabs, with cover identification at front and side. Include set of reduced drawings with air outlets and equipment identified to correspond with data sheets, and indicating thermostat locations.
   4. Include actual instrument list, with manufacturer name, serial number, and date of calibration.
   5. Form of Test Reports: Where the TAB standard being followed recommends a report format use that; otherwise, follow ASHRAE Std 111.
   6. Units of Measure: Report data in both I-P (inch-pound) and SI (metric) units.
   7. Include the following on the title page of each report:
      a. Name of Testing, Adjusting, and Balancing Agency.

b. Address of Testing, Adjusting, and Balancing Agency.
c. Telephone number of Testing, Adjusting, and Balancing Agency.
d. Project name.
e. Project location.
f. Project Architect.
g. Project Engineer.
h. Project Contractor.
i. Project altitude.
j. Report date.

8. Include a summary of the following:
   a. Design vesus final performance.
   b. Notable characteristics of system.
   c. Description of systems operation sequence.
   d. Summary of outdoor and exhaust air quantities to indicated building pressurization.
   e. Nomenclature used throughout report.
   f. Test conditions.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION**

**3.01 GENERAL REQUIREMENTS**

A. Perform total system balance in accordance with one of the following:
   1. AABC (NSTSB), AABC National Standards for Total System Balance.
   2. ASHRAE Std 111, Practices for Measurement, Testing, Adjusting and Balancing of Building Heating, Ventilation, Air-Conditioning, and Refrigeration Systems.
   3. NEBB Procedural Standards for Testing Adjusting Balancing of Environmental Systems.
   4. SMACNA (TAB).

B. Begin work after completion of systems to be tested, adjusted, or balanced and complete work prior to Substantial Completion of the project.

C. Where HVAC systems and/or components interface with life safety systems, including fire and smoke detection, alarm, and control, coordinate scheduling and testing and inspection procedures with the authorities having jurisdiction.

D. TAB Agency Qualifications:
   1. Company specializing in the testing, adjusting, and balancing of systems specified in this section.
   2. Having minimum of three years documented experience.
   3. Certified by one of the following:
      a. AABC, Associated Air Balance Council; upon completion submit AABC National Performance Guaranty.
      b. NEBB, National Environmental Balancing Bureau:
      c. TABB, The Testing, Adjusting, and Balancing Bureau of National Energy Management Institute:

E. TAB Supervisor and Technician Qualifications: Certified by same organization as TAB agency.

**3.02 EXAMINATION**

A. Verify that systems are complete and operable before commencing work. Ensure the following conditions:
   1. Systems are started and operating in a safe and normal condition.
   2. Temperature control systems are installed complete and operable.
   3. Proper thermal overload protection is in place for electrical equipment.
   4. Final filters are clean and in place. If required, install temporary media in addition to final filters.
   5. Duct systems are clean of debris.
   6. Fans are rotating correctly.

7. Fire and volume dampers are in place and open.
8. Air coil fins are cleaned and combed.
9. Access doors are closed and duct end caps are in place.
10. Air outlets are installed and connected.
11. Duct system leakage is minimized.

B. Submit field reports. Report defects and deficiencies that will or could prevent proper system balance.

C. Beginning of work means acceptance of existing conditions.

**3.03 PREPARATION**

A. Provide instruments required for testing, adjusting, and balancing operations. Make instruments available to Architect to facilitate spot checks during testing.

B. Provide additional balancing devices as required.

**3.04 ADJUSTMENT TOLERANCES**

A. Air Handling Systems: Adjust to within plus or minus 5 percent of design for supply systems and plus or minus 10 percent of design for return and exhaust systems.

B. Air Outlets and Inlets: Adjust total to within plus 10 percent and minus 5 percent of design to space. Adjust outlets and inlets in space to within plus or minus 10 percent of design.

**3.05 RECORDING AND ADJUSTING**

A. Ensure recorded data represents actual measured or observed conditions.

B. Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops.

C. Mark on the drawings the locations where traverse and other critical measurements were taken and cross reference the location in the final report.

D. After adjustment, take measurements to verify balance has not been disrupted or that such disruption has been rectified.

E. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.

F. At final inspection, recheck random selections of data recorded in report. Recheck points or areas as selected and witnessed by the Owner.

G. Check and adjust systems approximately six months after final acceptance and submit report.

**3.06 AIR SYSTEM PROCEDURE**

A. Adjust air handling and distribution systems to provide required or design supply, return, and exhaust air quantities.

B. Make air quantity measurements in ducts by Pitot tube traverse of entire cross sectional area of duct.

C. Measure air quantities at air inlets and outlets.

D. Adjust distribution system to obtain uniform space temperatures free from objectionable drafts and noise.

E. Use volume control devices to regulate air quantities only to extend that adjustments do not create objectionable air motion or sound levels. Effect volume control by duct internal devices such as dampers and splitters.

F. Vary total system air quantities by adjustment of fan speeds. Provide drive changes required. Vary branch air quantities by damper regulation.

G. Provide system schematic with required and actual air quantities recorded at each outlet or inlet.

H. Measure static air pressure conditions on air supply units, including filter and coil pressure drops, and total pressure across the fan. Make allowances for 50 percent loading of filters.

I. Adjust outside air automatic dampers, outside air, return air, and exhaust dampers for design conditions.

J. Measure temperature conditions across outside air, return air, and exhaust dampers to check leakage.

K. Measure building static pressure and adjust supply, return, and exhaust air systems to provide required relationship between each to maintain approximately 0.05 inches (12.5 Pa) positive static pressure near the building entries.

L. For variable air volume system powered units set volume controller to air flow setting indicated. Confirm connections properly made and confirm proper operation for automatic variable air volume temperature control.

M. Include one (1) additional set of belts and sheaves and rebalancing for each system for the project at no additional cost to the Owner.

**3.07 SCOPE**

A. Test, adjust, and balance the following:
   1. Packaged Rooftop Heating/Cooling Units.
   2. Fans.
   3. Air Inlets and Outlets.

**3.08 MINIMUM DATA TO BE REPORTED**

A. Electric Motors:
   1. Manufacturer.
   2. Model/Frame.
   3. HP/BHP.
   4. Phase, voltage, amperage; nameplate, actual, no load.
   5. RPM.
   6. Service factor.
   7. Starter size, rating, heater elements.
   8. Sheave Make/Size/Bore.

B. V-Belt Drives:
   1. Identification/location.
   2. Required driven RPM.
   3. Driven sheave, diameter and RPM.
   4. Belt, size and quantity.
   5. Motor sheave diameter and RPM.
   6. Center to center distance, maximum, minimum, and actual.

C. Packaged Rooftop Heating/Cooling Units:
   1. Location.
   2. Manufacturer.
   3. Model number.
   4. Serial number.
   5. Air flow, specified and actual.
   6. Return air flow, specified and actual.
   7. Outside air flow, specified and actual.
   8. Total static pressure (total external), specified and actual.
   9. Inlet pressure.
   10. Discharge pressure.
   11. Sheave Make/Size/Bore.
   12. Number of Belts/Make/Size.
   13. Fan RPM.
   14. Entering air DB temperature, design and actual.
   15. Entering air WB temperature, design and actual.
   16. Leaving supply air DB temperature, design and actual.

17. Leaving supply air WB temperature, design and actual.

D. Return Air/Outside Air:
   1. Identification/location.
   2. Design air flow.
   3. Actual air flow.
   4. Design return air flow.
   5. Actual return air flow.
   6. Design outside air flow.
   7. Actual outside air flow.
   8. Return air temperature.
   9. Outside air temperature.
   10. Required mixed air temperature.
   11. Actual mixed air temperature.
   12. Design outside/return air ratio.
   13. Actual outside/return air ratio.

E. Exhaust Fans:
   1. Location.
   2. Manufacturer.
   3. Model number.
   4. Serial number.
   5. Air flow, specified and actual.
   6. Total static pressure (total external), specified and actual.
   7. Inlet pressure.
   8. Discharge pressure.
   9. Sheave Make/Size/Bore.
   10. Number of Belts/Make/Size.
   11. Fan RPM.

F. Duct Traverses:
   1. System zone/branch.
   2. Duct size.
   3. Area.
   4. Design velocity.
   5. Design air flow.
   6. Test velocity.
   7. Test air flow.
   8. Duct static pressure.
   9. Air temperature.
   10. Air correction factor.

G. Air Distribution Tests:
   1. Air terminal number.
   2. Room number/location.
   3. Terminal type.
   4. Terminal size.
   5. Area factor.
   6. Design velocity.
   7. Design air flow.
   8. Test (final) velocity.
   9. Test (final) air flow.
   10. Percent of design air flow.

**3.09 ROOFTOP UNIT START-UP**

A. HVAC Subcontractor shall have the final start-up of all HVAC equipment surpervised and monitored by a factory authorized technician. Rooftop units shall be cycled through cooling

mode, heating mode and economizer mode to ensure proper operation. Factory technician shall completely check all units and systems; verifying proper installation and operation of all equipment, piping, control and power wiring, economizers, fan rotation, accessories, etc. HVAC Subcontractor shall pay all costs associated with this service, Equipment Operation Check (EOC). General Contractor shall submit to Dick's Sporting Goods and Engineer a copy of the final EOC. EOC shall include the following information:

1. Project name.
2. Project Store #.
3. Project location.
4. Project Architect.
5. Project Engineer.
6. Project General Contractor.
7. Project HVAC Subcontractor.
8. Project Factory Authorized Technician.
9. Date of Report.
10. Description of rooftop units.
    a. New or existing.
    b. Model #
    c. Serial #
    d. Rooftop unit charachteristics.
11. Description of defects or deficiencies along with proposed corrective action.

**END OF SECTION**

# SECTION 23 0713
# DUCT INSULATION

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Duct insulation.

B. Duct liner.

### 1.02 RELATED REQUIREMENTS

A. Section 09 9000 - Painting and Coating: Painting insulation jackets.

B. Section 23 0553 - Identification for HVAC Equipment.

C. Section 23 3100 - Ductwork.

### 1.03 REFERENCE STANDARDS

A. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2017.

B. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications; 2013.

C. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation; 2014.

D. ASTM C916 - Standard Specification for Adhesives for Duct Thermal Insulation; 2014.

E. ASTM C1071 - Standard Specification for Fibrous Glass Duct Lining Insulation (Thermal and Sound Absorbing Material); 2016.

F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2017.

G. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2016.

H. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015.

I. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2005 (Rev. 2009).

J. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

### 1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.

C. Manufacturer's Instructions: Indicate installation procedures necessary to ensure acceptable workmanship and that installation standards will be achieved.

### 1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section with not less than five years of documented experience.

B. Applicator Qualifications: Company specializing in performing the type of work specified in this section, with minimum three years of experience and approved by manufacturer.

### 1.06 DELIVERY, STORAGE, AND HANDLING

A. Accept materials on site in original factory packaging, labelled with manufacturer's identification, including product density and thickness.

B. Protect insulation from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original wrapping.

## 1.07 FIELD CONDITIONS

A. Maintain ambient temperatures and conditions required by manufacturers of adhesives, mastics, and insulation cements.

B. Maintain temperature during and after installation for minimum period of 24 hours.

# PART 2 PRODUCTS

## 2.01 REGULATORY REQUIREMENTS

A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with NFPA 90A and 90B, NFPA 255, ASTM E84, and UL 723.

## 2.02 GLASS FIBER, FLEXIBLE

A. Manufacturer:
   1. Knauf Insulation.
   2. Johns Manville.
   3. Owens Corning Corporation.
   4. CertainTeed Corporation.

B. Insulation: ASTM C553; flexible, noncombustible blanket.
   1. Type 100, 'K' ('Ksi') value, labeled thickness: 0.27 at 75 degrees F (0.039 at 24 degrees C), when tested in accordance with ASTM C518.
   2. Maximum Service Temperature: 250 degrees F (121 degrees C).
   3. Maximum Water Vapor Absorption: 5.0 percent by weight.

C. Vapor Barrier Jacket:
   1. Kraft paper with glass fiber yarn and bonded to aluminized film.
   2. Moisture Vapor Permeability: 0.02 perm inch (0.029 ng/Pa s m), when tested in accordance with ASTM E96/E96M.
   3. Secure with pressure sensitive tape.

D. Vapor Barrier Tape:
   1. Kraft paper reinforced with glass fiber yarn and bonded to aluminized film, with pressure sensitive rubber based adhesive.

E. Tie Wire: Annealed steel, 16 gage, 0.0508 inch diameter (1.29 mm diameter).

F. R Value: Insulation R-value shall meet minimum local and state energy code requirements.

## 2.03 GLASS FIBER, RIGID

A. Manufacturer:
   1. Knauf Insulation
   2. Johns Manville
   3. Owens Corning Corporation
   4. CertainTeed Corporation

B. Insulation: ASTM C612; rigid, noncombustible blanket.
   1. 'K' ('Ksi') Value: 0.23 at 75 degrees F (0.033 at 24 degrees C), when tested in accordance with ASTM C518.
   2. Maximum Service Temperature: 450 degrees F (232 degrees C).
   3. Maximum Water Vapor Absorption: 5.0 percent.

C. Vapor Barrier Jacket:
   1. Kraft paper with glass fiber yarn and bonded to aluminized film.
   2. Moisture Vapor Permeability: 0.02 perm inch (0.029 ng/Pa s m), when tested in accordance with ASTM E96/E96M.
   3. Secure with pressure sensitive tape.

D. Vapor Barrier Tape:
   1. Kraft paper reinforced with glass fiber yarn and bonded to aluminized film, with pressure sensitive rubber based adhesive.

E. R Value: Insulation R-value shall meet minimum local and state energy code requirements.

**2.04 DUCT LINER**

A. Manufacturers:
   1. Knauf Insulation.
   2. Johns Manville.
   3. Owens Corning Corporation.
   4. CertainTeed Corporation.

B. Glass Fiber Insulation: Non-corrosive, incombustible glass fiber complying with ASTM C1071.
   1. Fungal Resistance: No growth when tested according to ASTM G21.
   2. Apparent Thermal Conductivity: Maximum of 0.24 at 75 degrees F (1.36 at 24 degrees C).
   3. Service Temperature: Up to 250 degrees F (121 degrees C).
   4. Rated Velocity on Coated Air Side for Air Erosion: 5,000 fpm (25.4 m/s), minimum.

C. Adhesive: Waterproof, fire-retardant type, ASTM C916.

D. Liner Fasteners: Galvanized steel, welded with press-on head.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

A. Verify that ducts have been tested before applying insulation materials.

B. Verify that surfaces are clean, foreign material removed, and dry.

**3.02 INSTALLATION**

A. Install in accordance with manufacturer's instructions.

B. Install in accordance with NAIMA National Insulation Standards.

C. Insulated ducts conveying air below ambient temperature:
   1. Provide insulation with vapor barrier jackets.
   2. Finish with tape and vapor barrier jacket.
   3. Continue insulation through walls, sleeves, hangers, and other duct penetrations.
   4. Insulate entire system including fittings, joints, flanges, fire dampers, flexible connections, and expansion joints.

D. Insulated ducts conveying air above ambient temperature:
   1. Provide with or without standard vapor barrier jacket.
   2. Insulate fittings and joints. Where service access is required, bevel and seal ends of insulation.

E. External Duct Insulation Application:
   1. Secure insulation with vapor barrier with wires and seal jacket joints with vapor barrier adhesive or tape to match jacket.
   2. Secure insulation without vapor barrier with staples, tape, or wires.
   3. Install without sag on underside of duct. Use adhesive or mechanical fasteners where necessary to prevent sagging. Lift duct off trapeze hangers and insert spacers.
   4. Seal vapor barrier penetrations by mechanical fasteners with vapor barrier adhesive.
   5. Stop and point insulation around access doors and damper operators to allow operation without disturbing wrapping.

F. Duct Liner Application:
   1. Adhere insulation with adhesive for 90 percent coverage.
   2. Secure insulation with mechanical liner fasteners. Refer to SMACNA (DCS) for spacing.
   3. Seal and smooth joints. Seal and coat transverse joints.
   4. Seal liner surface penetrations with adhesive.
   5. Duct dimensions indicated are net inside dimensions required for air flow. Increase duct size to allow for insulation thickness.

### 3.03 SCHEDULES

A. Flexible Duct Insulation:
   1. Concealed lined and unlined supply and return air ductwork: 2" thick
   2. Backs of diffusers and grilles in ceilings: 2" thick
   3. Concealed outside air ductwork: 2" thick
   4. Concealed exhaust ductwork within 15'-0" of exterior opening: 2" thick

B. Rigid Duct Insulation:
   1. Exposed exhaust ductwork within 15'-0" of exterior opening: 1-1/2" thick
   2. Exposed outside air ductwork: 1-1/2" thick

C. Duct Liner Insulation:
   1. Supply and return air ductwork where indicated on drawings: 1" thick
   2. Air transfer ductwork where indicated on drawings: 1/2" thick

**END OF SECTION**

## SECTION 23 3100
## DUCTWORK

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Metal ductwork.

B. Duct cleaning.

### 1.02 RELATED REQUIREMENTS

A. Section 09 9000 - Painting and Coating: Weld priming, weather resistant, paint or coating.

B. Section 23 0593 - Testing, Adjusting, and Balancing for HVAC.

C. Section 23 0713 - Duct Insulation: External insulation and duct liner.

D. Section 23 3300 - Ductwork Accessories.

E. Section 23 3700 - Air Outlets and Inlets.

### 1.03 REFERENCE STANDARDS

A. ASHRAE (FUND) - ASHRAE Handbook - Fundamentals; 2017.

B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.

C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015, with Editorial Revision (2016).

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2017.

E. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2015.

F. NFPA 90B - Standard for the Installation of Warm Air Heating and Air-Conditioning Systems; 2015.

G. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2005 (Rev. 2009).

H. SMACNA (LEAK) - HVAC Air Duct Leakage Test Manual; 2012, 2nd Edition.

I. UL 181 - Standard for Factory-Made Air Ducts and Air Connectors; current edition, including all revisions.

### 1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data for duct materials, duct liner, and duct connections.

C. Shop Drawings: Indicate duct fittings, particulars such as gages, sizes, welds, and configuration prior to start of work for all systems.

D. Project Record Documents: Record actual locations of ducts and duct fittings. Record changes in fitting location and type. Show additional fittings used.

### 1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum five years of documented experience.

B. Installer Qualifications: Company specializing in performing the type of work specified in this section, with minimum three years of documented experience.

### 1.06 FIELD CONDITIONS

A. Do not install duct sealants when temperatures are less than those recommended by sealant manufacturers.

B. Maintain temperatures within acceptable range during and after installation of duct sealants.

## PART 2 PRODUCTS

### 2.01 DUCT ASSEMBLIES

A. Regulatory Requirements: Construct ductwork to NFPA 90A and NFPA 90B standards.

B. Ducts: Galvanized steel, unless otherwise indicated.

C. Low Pressure Supply (Heating Systems): 2 inch w.g. (500 Pa) pressure class, galvanized steel.

D. Low Pressure Supply (System with Cooling Coils): 2 inch w.g. (500 Pa) pressure class, galvanized steel.

E. Return and Relief: 1 inch w.g. (250 Pa) pressure class, galvanized steel.

F. General Exhaust: 1 inch w.g. (250 Pa) pressure class, galvanized steel.

G. Outside Air Intake: 1 inch w.g. (250 Pa) pressure class, galvanized steel.

H. Transfer Air: 1 inch w.g. (250 Pa) pressure class, galvanized steel.

### 2.02 MATERIALS

A. Galvanized Steel for Interior Ductwork: Hot-dipped galvanized steel sheet, ASTM A653/A653M FS Type B, with G60/Z180 coating.

B. Galvanized Steel for Exterior Ductwork: Hot-dipped galvanized steel sheet, ASTM A653/A653M FS Type B, with G90/Z275 coating.

C. Joint Sealers and Sealants: Non-hardening, water resistant, mildew and mold resistant.
   1. Type: Heavy mastic or liquid used alone or with tape, suitable for joint configuration and compatible with substrates, and recommended by manufacturer for pressure class of ducts.
   2. Surface Burning Characteristics: Flame spread index of zero and smoke developed index of zero, when tested in accordance with ASTM E84.
   3. For Use With Flexible Ducts: UL labeled.

D. Hanger Rod: ASTM A36/A36M; steel, galvanized; threaded both ends, threaded one end, or continuously threaded.

### 2.03 DUCTWORK FABRICATION

A. Fabricate and support in accordance with SMACNA (DCS) and as indicated.

B. No variation of duct configuration or size permitted except by written permission. Size round duct installed in place of rectangular ducts in accordance with ASHRAE (FUND) Handbook - Fundamentals.

C. Provide duct material, gauges, reinforcing, and sealing for operating pressures indicated.

D. Construct T's, bends, and elbows with radius of not less than 1-1/2 times width of duct on centerline. Where not possible and where rectangular elbows must be used, provide air foil turning vanes of perforated metal.

E. Provide turning vanes of perforated metal with glass fiber insulation when acoustical lining is indicated.

F. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.

G. Fabricate continuously welded round and oval duct fittings in accordance with SMACNA (DCS).

H. All branch connection fittings in rectangular ductwork shall be 45 degree transition type, conical fittings or spin-in fittings with integral air scoops. Butt fittings are not acceptable.

I. Pittsburg lock shall be used on all longitudinal seams. All longitudinal seams shall be sealed with mastic. Snaplock is not acceptable.

### 2.04 MANUFACTURED DUCTWORK AND FITTINGS

A. Round Ducts: Machine made from round spiral lockseam duct.

1. Manufacture in accordance with SMACNA (DCS).
2. Fittings: Manufacture at least two gages heavier metal than duct.
3. Provide duct material, gauges, reinforcing, and sealing for operating pressures indicated.

B. Flexible Ducts: Black polymer film supported by helically wound spring steel wire.
1. UL labeled.
2. Insulation: Fiberglass insulation with aluminized vapor barrier film.
3. Pressure Rating: 4 inches WG (1000 Pa) positive and 0.5 inches WG (175 Pa) negative.
4. Maximum Velocity: 4000 fpm (20.3 m/sec).
5. Temperature Range: Minus 20 degrees F to 175 degrees F (Minus 28 degrees C to 79 degrees C).
6. R Value: Insulation R-value shall meet minimum local and state energy code requirements.

C. Transverse Duct Connection System: SMACNA "E" rated rigidly class connection, interlocking angle and duct edge connection system with sealant, gasket, cleats, and corner clips in accordance with SMACNA (DCS).

## PART 3 EXECUTION

### 3.01 INSTALLATION

A. Install, support, and seal ducts in accordance with SMACNA (DCS).

B. Install in accordance with manufacturer's instructions.

C. During construction provide temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.

D. Flexible Ducts: Connect to metal ducts with adhesive plus sheet metal screws.

E. Provide openings in ductwork where required to accommodate thermometers and controllers. Provide pilot tube openings where required for testing of systems, complete with metal can with spring device or screw to ensure against air leakage. Where openings are provided in insulated ductwork, install insulation material inside a metal ring.

F. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.

G. Use crimp joints with or without bead for joining round duct sizes 8 inch (200 mm) and smaller with crimp in direction of air flow.

H. Use double nuts and lock washers on threaded rod supports.

I. Connect diffusers to low pressure ducts with 5 feet (1.5 m) maximum length of flexible duct held in place with strap or clamp.

J. Duct dimensions indicated on drawings are exterior and include lining.

K. All ductwork in areas without ceilings that is to be painted shall be provided with paint grip finish.

### 3.02 CLEANING

A. Clean duct system and force air at high velocity through duct to remove accumulated dust. To obtain sufficient air, clean half the system at a time. Protect equipment that could be harmed by excessive dirt with temporary filters, or bypass during cleaning.

**END OF SECTION**

# SECTION 23 3300
# DUCTWORK ACCESSORIES

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Air turning devices/extractors.

B. Backdraft dampers - metal.

C. Duct access doors.

D. Duct test holes.

E. Fire dampers.

F. Flexible duct connections.

G. Volume control dampers.

### 1.02 RELATED REQUIREMENTS

A. Section 23 3100 - Ductwork.

B. Section 26 0583 - Wiring Connections: Electrical characteristics and wiring connections.

### 1.03 REFERENCE STANDARDS

A. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2015.

B. NFPA 92 - Standard for Smoke Control Systems; 2015.

C. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2005 (Rev. 2009).

D. UL 33 - Safety Heat Responsive Links for Fire-Protection Service; Current Edition, Including All Revisions.

E. UL 555 - Standard for Fire Dampers; Current Edition, Including All Revisions.

F. UL 555S - Standard for Smoke Dampers; Current Edition, Including All Revisions.

### 1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide for shop fabricated assemblies including volume control dampers, duct access doors, duct test holes, and hardware used. Include electrical characteristics and connection requirements.

C. Manufacturer's Installation Instructions: Provide instructions for fire dampers.

D. Project Record Drawings: Record actual locations of access doors and test holes.

### 1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum five years of documented experience.

B. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

### 1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect dampers from damage to operating linkages and blades.

## PART 2 PRODUCTS

### 2.01 AIR TURNING DEVICES/EXTRACTORS

A. Multi-blade device with blades aligned in short dimension; steel construction; with individually adjustable blades, mounting straps.

### 2.02 BACKDRAFT DAMPERS - METAL

A. Gravity Backdraft Dampers, Size 18 by 18 inches (450 by 450 mm) or Smaller, Furnished with Air Moving Equipment: Air moving equipment manufacturer's standard construction.

B. Multi-Blade, Parallel Action Gravity Balanced Backdraft Dampers: Galvanized steel, with center pivoted blades of maximum 6 inch (150 mm) width, with felt or flexible vinyl sealed edges, linked together in rattle-free manner with 90 degree stop, steel ball bearings, and plated steel pivot pin; adjustment device to permit setting for varying differential static pressure.

**2.03 DUCT ACCESS DOORS**

A. Fabricate in accordance with SMACNA (DCS) and as indicated.

B. Access doors with sheet metal screw fasteners are not acceptable.

**2.04 DUCT TEST HOLES**

A. Temporary Test Holes: Cut or drill in ducts as required. Cap with neat patches, neoprene plugs, threaded plugs, or threaded or twist-on metal caps.

B. Permanent Test Holes: Factory fabricated, air tight flanged fittings with screw cap. Provide extended neck fittings to clear insulation.

**2.05 FIRE DAMPERS**

A. Manufacturers:
   1. Greenheck
   2. Louvers & Dampers, Inc.:
   3. POTTORFF
   4. Ruskin

B. Fabricate in accordance with NFPA 90A and UL 555, and as indicated.

C. Ceiling Dampers: Galvanized steel, 22 gage, 0.0299 inch (0.76 mm) frame and 16 gage, 0.0598 inch (1.52 mm) flap, two layers 0.125 inch (3.2 mm) ceramic fiber on top side and one layer on bottom side for round flaps, with locking clip.

D. Horizontal Dampers: Galvanized steel, 22 gage, 0.0299 inch (0.76 mm) frame, stainless steel closure spring, and lightweight, heat retardant non-asbestos fabric blanket.

E. Curtain Type Dampers: Galvanized steel with interlocking blades. Provide stainless steel closure springs and latches for horizontal installations. Configure with blades out of air stream except for 1.0 inch (250 Pa) pressure class ducts up to 12 inches (300 mm) in height.

F. Multiple Blade Dampers: 16 gage, 0.0598 inch (1.52 mm) galvanized steel frame and blades, oil-impregnated bronze or stainless steel sleeve bearings and plated steel axles, 1/8 by 1/2 inch (3.2 by 12.7 mm) plated steel concealed linkage, stainless steel closure spring, blade stops, and lock.

G. Fusible Links: UL 33, separate at 160 degrees F (71 degrees C) with adjustable link straps for combination fire/balancing dampers.

H. Fire dampers shall be dynamic rated.

**2.06 FLEXIBLE DUCT CONNECTIONS**

A. Fabricate in accordance with SMACNA (DCS) and as indicated.

B. Flexible Duct Connections: Fabric crimped into metal edging strip.
   1. Fabric: UL listed fire-retardant neoprene coated woven glass fiber fabric to NFPA 90A, minimum density 30 oz per sq yd (1.0 kg/sq m).
      a. Net Fabric Width: Approximately 2 inches (50 mm) wide.
   2. Metal: 3 inches (75 mm) wide, 24 gage, 0.0239 inch (0.61 mm) thick galvanized steel.

C. Leaded Vinyl Sheet: Minimum 0.55 inch (14 mm) thick, 0.87 lbs per sq ft (4.2 kg/sq m), 10 dB attenuation in 10 to 10,000 Hz range.

D. Maximum Installed Length: 14 inch (356 mm).

**2.07 VOLUME CONTROL DAMPERS**

A. Fabricate in accordance with SMACNA (DCS) and as indicated.

B. Splitter Dampers:

1. Material: Same gage as duct to 24 inches (600 mm) size in either direction, and two gages heavier for sizes over 24 inches (600 mm).
2. Blade: Fabricate of single thickness sheet metal to streamline shape, secured with continuous hinge or rod.
3. Operator: Minimum 1/4 inch (6 mm) diameter rod in self aligning, universal joint action, flanged bushing with set screw .

C. Single Blade Dampers:
1. Fabricate for duct sizes up to 6 by 30 inch (150 by 760 mm).
2. Blade: 24 gage, 0.0239 inch (0.61 mm), minimum.

D. Multi-Blade Damper: Fabricate of opposed blade pattern with maximum blade sizes 8 by 72 inch (200 by 1825 mm). Assemble center and edge crimped blades in prime coated or galvanized channel frame with suitable hardware.
1. Blade: 18 gage, 0.0478 inch (1.21 mm), minimum.

E. End Bearings: Except in round ducts 12 inches (300 mm) and smaller, provide end bearings. On multiple blade dampers, provide oil-impregnated nylon, thermoplastic elastomer, or sintered bronze bearings.

F. Quadrants:
1. Provide locking, indicating quadrant regulators on single and multi-blade dampers.
2. On insulated ducts mount quadrant regulators on stand-off mounting brackets, bases, or adapters.
3. Where rod lengths exceed 30 inches (750 mm) provide regulator at both ends.

## PART 3 EXECUTION

### 3.01 PREPARATION

A. Verify that electric power is available and of the correct characteristics.

### 3.02 INSTALLATION

A. Install accessories in accordance with manufacturer's instructions, NFPA 90A, and follow SMACNA (DCS). Refer to Section 23 3100 for duct construction and pressure class.

B. Provide backdraft dampers on exhaust fans or exhaust ducts nearest to outside and where indicated.

C. Provide duct access doors for inspection and cleaning before and after filters, coils, fans, automatic dampers, at fire dampers, and elsewhere as indicated. Provide minimum 8 by 8 inch (200 by 200 mm) size for hand access, 18 by 18 size for shoulder access, and/or as indicated. Provide 4 by 4 inch (100 by 100 mm) for balancing dampers only. Review locations prior to fabrication.

D. Provide duct test holes where indicated and required for testing and balancing purposes.

E. Provide fire dampers at locations indicated, where ducts and outlets pass through fire rated components, and where required by Authorities Having Jurisdiction. Install with required perimeter mounting angles, sleeves, breakaway duct connections, corrosion resistant springs, bearings, bushings and hinges.

F. Demonstrate re-setting of fire dampers to Owner's representative.

G. At fans and motorized equipment associated with ducts, provide flexible duct connections immediately adjacent to the equipment.

H. Provide balancing dampers at points on supply, return, and exhaust systems where branches are taken from larger ducts as required for air balancing. Install minimum 2 duct widths from duct take-off.

I. Use splitter dampers only where indicated.

J. Provide balancing dampers on duct take-off to diffusers, grilles, and registers, regardless of whether dampers are specified as part of the diffuser, grille, or register assembly.

**END OF SECTION**

## SECTION 23 3700
## AIR OUTLETS AND INLETS

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Diffusers.

B. Registers/grilles.

### 1.02 RELATED REQUIREMENTS

A. Section 09 9000 - Painting and Coating: Painting of ducts visible behind outlets and inlets.

### 1.03 REFERENCE STANDARDS

A. AMCA 500-L - Laboratory Methods of Testing Louvers for Rating; 2015.

B. ASHRAE Std 70 - Method of Testing the Performance of Air Outlets and Inlets; 2006 (R2011).

### 1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data for equipment required for this project. Review outlets and inlets as to size, finish, and type of mounting prior to submission. Submit schedule of outlets and inlets showing type, size, location, application, and noise level.

C. Project Record Documents: Record actual locations of air outlets and inlets.

### 1.05 QUALITY ASSURANCE

A. Test and rate air outlet and inlet performance in accordance with ASHRAE Std 70.

B. Test and rate louver performance in accordance with AMCA 500-L.

C. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum five years of documented experience.

### PART 2 PRODUCTS

### 2.01 MANUFACTURERS

A. Diffusers, Registers and Grilles
   1. Krueger
   2. Metalaire
   3. Nailor
   4. Price
   5. Titus
   6. Tuttle and Bailey

### 2.02 RECTANGULAR CEILING DIFFUSERS

A. Type: Provide square, fully louvered ceiling diffuser to discharge air in two way, three way, and four way pattern as indicated on plans.

B. Connections: Round.

C. Frame: Provide surface mount and inverted T-bar type as indicated on drawings.

D. Construction: Steel or aluminum with baked enamel finish as indicated on drawings.

E. Color: As indicated on drawings.

F. Accessories: Provide radial opposed blade volume control damper; removable core with damper adjustable from diffuser face.

G. Provide 24"x24" ceiling diffuser module with 18"x18" louvered face or 12"x12" ceiling diffuser moddule with 9"x9" louvered face as indicated on plans.

## 2.03 CEILING SUPPLY REGISTERS/GRILLES

A. Type: Streamlined and individually adjustable curved blades to discharge air along face of grille, 3/4" maximum spacing, two-way deflection.

B. Frame: 1-1/4 inch (32 mm) margin with countersunk screw mounting and gasket.

C. Construction: Made of steel or aluminum as indicated on drawings with factory enamel finish.

D. Color: As indicated on drawings.

E. Damper: Integral, gang-operated, opposed blade type with removable key operator, operable from face.

## 2.04 CEILING EXHAUST AND RETURN REGISTERS/GRILLES

A. Type: Streamlined blades, 3/4 inch (19 mm) minimum depth, 3/4 inch (19 mm) maximum spacing, with blades set at 45 degrees, horizontal face.

B. Frame: 1-1/4 inch (32 mm) margin with countersunk screw mounting.

C. Construction: Steel with 20 gage, 0.0359 inch (0.91 mm) minimum frames and 22 gage, 0.0299 inch (0.76 mm) minimum blades, steel and aluminum with 20 gage, 0.0359 inch (0.91 mm) minimum frame, or aluminum extrusions, with factory baked enamel finish.

D. Color: As indicated on the drawings.

E. Damper: Integral, gang-operated, opposed blade type with removable key operator, operable from face where not individually connected to exhaust fans.

## 2.05 CEILING EGG CRATE EXHAUST AND RETURN GRILLES

A. Type: Egg crate style face consisting of 1/2 by 1/2 by 1/2 inch (13 by 13 by 13 mm) grid core.

B. Construction: Grid core consists of aluminum with mill aluminum finish.

C. Color: As indicated on the drawings.

D. Frame: 1-1/4 inch (32 mm) margin with countersunk screw mounting.

E. Frame: Channel lay-in frame for suspended grid ceilings.

F. Accessories: Provide integral, gang & face operated opposed blade damper.

## 2.06 WALL SUPPLY REGISTERS/GRILLES

A. Type: Streamlined and individually adjustable blades, 3/4 inch (19 mm) minimum depth, 3/4 inch (19 mm) maximum spacing with spring or other device to set blades, horizontal face, double deflection.

B. Frame: 1-1/4 inch (32 mm) margin with countersunk screw mounting and gasket.

C. Construction: Steel with 20 gage, 0.0359 inch (0.91 mm) minimum frames and 22 gage, 0.0299 inch (0.76 mm) minimum blades, steel and aluminum with 20 gage, 0.0359 inch (0.91 mm) minimum frame, or aluminum extrusions, with factory baked enamel finish.

D. Color: As indicated on the drawings.

E. Damper: Integral, gang-operated opposed blade type with removable key operator, operable from face.

## 2.07 WALL EXHAUST AND RETURN REGISTERS/GRILLES

A. Type: Streamlined blades, 3/4 inch (19 mm) minimum depth, 3/4 inch (19 mm) maximum spacing, with spring or other device to set blades, vertical face.

B. Frame: 1-1/4 inch (32 mm) margin with countersunk screw mounting.

C. Construction: Steel frames and blades, with factory baked enamel finish.

D. Color: As indicated on the drawings.

E. Damper: Integral, gang-operated, opposed blade type with removable key operator, operable from face.

## PART 3 EXECUTION

### 3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Check location of outlets and inlets and make necessary adjustments in position to conform with architectural features, symmetry, and lighting arrangement.

C. Install diffusers to ductwork with air tight connection.

D. Provide balancing dampers on duct take-off to diffusers, and grilles and registers, despite whether dampers are specified as part of the diffuser, or grille and register assembly.

E. Paint ductwork visible behind air outlets and inlets matte black. Refer to Section 09 9123.

F. Provide aluminum diffusers, grilles and registers with baked enamel finish when located in toilet rooms and humid spaces.

**END OF SECTION**

**SECTION 26 0100**

**BASIC ELECTRICAL REQUIREMENTS**

## PART 1 - GENERAL

### 1.01 SECTION INCLUDES

A. Basic Electrical Requirements specifically applicable to Division 26 Sections, in addition to Division 1 - General Requirements.

### 1.02 SUBMITTALS

A. Submit under provisions of DIVISION 1 where specified in this Division.

B. Electrical Layout Drawings: Switchboard, panelboard, transformer, circuit breaker and disconnect switch submittals shall be accompanied by electrical room layouts, dimensioned or drawn to minimum 1/2 inch scale and showing code required clearances and access. Where electrical equipment is installed in mechanical rooms, the mechanical room layouts required under Division 23 shall include all electrical equipment with code required clearances and access.

C. Submit shop drawings and product data grouped to include complete submittals of related systems, products, and accessories in a single submittal.

D. Mark dimensions and values in units to match those specified.

### 1.03 REGULATORY REQUIREMENTS

A. Applicable codes as follows:
   1. Refer to plan title sheet.

B. All electrical equipment shall be listed by UL and installed in accordance with that listing.

C. Obtain permits, and request inspections from authority having jurisdiction.

### 1.04 PROJECT/SITE CONDITIONS

A. Install Work in locations shown on Drawings, unless prevented by Project conditions.

B. Prepare drawings showing proposed rearrangement of Work to meet Project conditions, including changes to Work specified in other Sections. Obtain permission of AOR before proceeding.

### 1.05 ELECTRICAL GENERAL PROVISIONS

A. Perform all work in accordance with ADA, the National Electrical Code, OSHA, pertinent NFPA codes, and the rules and regulations of all local, state and federal authorities having jurisdiction. Provide Owner (See Section 00 7100 for definition) with certificates of inspection.

B. Do all necessary cutting and rough patching.

C. These drawings indicate the size and general location of work. Scaled dimensions shall not be used. Dimensions not shown shall be obtained from the architectural drawings. For exact locations, height, door swings, mounting heights, etc., refer to architectural drawings and details.

D. Prior to starting any work, purchase of equipment, etc., coordinate the work with other trades. Confer with other contractors whose work might affect this installation, and arrange all parts of this work with the building construction and with architectural finish so that it will harmonize in service and appearance.

E. All workmanship and materials shall be guaranteed against defects for a period of one year from the date of final acceptance of the installation. Any portions of the workmanship and materials which develop defects during that time shall be replaced or repaired in a manner satisfactory to the AOR.

F. Provide insurance as specified in Division 1, and pay for all fees for permits and inspection of electrical work.

G. Prepare and furnish to the Owner (See Section 00 7100 for definition) and DSG "As-Built" plans for all work installed.

H. Submit to the AOR for approval, shop drawings of panelboards, lighting fixtures, and fire alarm system before fabrication or purchase of equipment is started.

I. Provide temporary light and power for the new construction areas, in accordance with National Electrical code and accepted standards established by OSHA. Energy costs will be borne by the General Contractor.

J. All parts of the work and associated equipment shall be tested and adjusted to work properly and be left in perfect operating condition. This shall include Megger Tests between phases and between each phase and ground of all feeders, subfeeders, switchboards, and panelboards. Correct defects disclosed by these tests without any additional cost to the Owner (See Section 00 7100 for definition). Repeat tests on repaired or replaced work.

K. Provide reconnections and temporary installation as required. Remove at job completion.

L. Provide blank plates on all unused remaining outlet boxes.

M. Should a bidder find discrepancies in or omissions from the drawings or specifications, notify the AOR for a written instructions to all bidders. If these are ignored by the General Contractor, he will be responsible for furnishing the proper or workable equipment as necessary.

N. Before submitting a bid, bidders will be held responsible to have visited the site of the work and fully inform themselves as to all existing conditions and limitations, including rules, rates and fringe benefits, travel pay, affiliation fees and transportation expense prevailing in the local labor market, and no allowances shall be subsequently be made on behalf of the bidder by reason of any error on his part.

O. Provide and install a complete and operating electrical installation in accordance with these specifications and accompanying contract drawings. This shall include all required labor, materials, apparatus and supervision. Work to be performed shall include, but not limited to, the following:
   1. A complete electrical distribution system including conduit and conductors, feeders, branch circuits, junction boxes, outlet boxes, wiring devices, coverplates, etc.
   2. The wiring of mechanical equipment as outlined in the Mechanical Equipment Schedule and in the specifications. Work shall include all power and control wiring, disconnect switches, etc., as required.
   3. A complete fire alarm system including fire alarm control panel, initiation and annunciator devices, all wiring, conduit, etc., including city connection circuit.
   4. Light fixtures as shown on the plans including all devices, equipment, etc., required for mounting, include all painting as required. All lamps required shall be furnished and installed by the Electrical Contractor.
   5. Contact Vendor 18 for light fixtures.

**PART 2 - PRODUCTS**

**2.01 NOT USED**

**PART 3 - EXECUTION**

**3.01 NOT USED**

**END OF SECTION**

## SECTION 26 0505
## SELECTIVE DEMOLITION FOR ELECTRICAL

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Demolition or abandonment of electrical systems (including low voltage systems).

### 1.02 RELATED REQUIREMENTS

A. Section 01 7000 - Execution and Closeout Requirements: Additional requirements for alterations work.

### 1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Sustainable Design Documentation: Submit certification of removal and appropriate disposal of abandoned cables containing lead stabilizers.

### PART 2 PRODUCTS

### 2.01 MATERIALS AND EQUIPMENT

A. Materials and equipment for patching and extending work: As specified in individual sections.

### PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verify field measurements and circuiting arrangements are as indicated.

B. Verify that abandoned wiring and equipment serve only abandoned facilities.

C. Demolition drawings are based on casual field observation and existing record documents.

D. Report discrepancies to Owner before disturbing existing installation.

E. Beginning of demolition means installer accepts existing conditions.

### 3.02 PREPARATION

A. Disconnect electrical systems in walls, floors, and ceilings to be removed.

B. Coordinate utility service outages with utility company.

C. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.

D. Existing Electrical Service: Maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Minimize outage duration.
   1. Obtain permission from Owner at least 24 hours before partially or completely disabling system.
   2. Make temporary connections to maintain service in areas adjacent to work area.

E. Existing Fire Alarm System: Maintain existing system in service until new system is accepted. Disable system only to make switchovers and connections. Minimize outage duration.
   1. Notify Owner before partially or completely disabling system.
   2. Notify local fire service.
   3. Make notifications at least 24 hours in advance.
   4. Make temporary connections to maintain service in areas adjacent to work area.

F. Existing Telephone System: Maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Minimize outage duration.
   1. Notify Owner at least 24 hours before partially or completely disabling system.
   2. Notify telephone utility company at least 24 hours before partially or completely disabling system.

3. Make temporary connections to maintain service in areas adjacent to work area.

G. Existing Intercomm System System: Maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Minimize outage duration.
   1. Obtain permission from Owner at least 24 hours before partially or completely disabling system.
   2. Make temporary connections to maintain service in areas adjacent to work area.

**3.03 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK**

A. Perform work for removal and disposal of equipment and materials containing toxic substances regulated under the Federal Toxic Substances Control Act (TSCA) in accordance with applicable federal, state, and local regulations. Applicable equipment and materials include, but are not limited to:
   1. PCB-containing electrical equipment, including transformers, capacitors, and switches.
   2. PCB- and DEHP-containing lighting ballasts.
   3. Mercury-containing lamps and tubes, including fluorescent lamps, high intensity discharge (HID), arc lamps, ultra-violet, high pressure sodium, mercury vapor, ignitron tubes, neon, and incandescent.

B. Remove, relocate, and extend existing installations to accommodate new construction.

C. Remove abandoned wiring to source of supply.

D. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.

E. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets that are not removed.

F. Disconnect and remove abandoned panelboards and distribution equipment.

G. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.

H. Disconnect and remove abandoned luminaires. Remove brackets, stems, hangers, and other accessories.

I. Repair adjacent construction and finishes damaged during demolition and extension work.

J. Maintain access to existing electrical installations that remain active. Modify installation or provide access panel as appropriate.

K. Extend existing installations using materials and methods compatible with existing electrical installations, or as specified.

**3.04 CLEANING AND REPAIR**

A. Clean and repair existing materials and equipment that remain or that are to be reused.

B. Panelboards: Clean exposed surfaces and check tightness of electrical connections. Replace damaged circuit breakers and provide closure plates for vacant positions. Provide typed circuit directory showing revised circuiting arrangement.

C. Luminaires: Remove existing luminaires for cleaning. Use mild detergent to clean all exterior and interior surfaces; rinse with clean water and wipe dry. Replace lamps, ballasts and broken electrical parts.

**END OF SECTION**

## SECTION 26 0519

## LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Single conductor building wire.

B. Metal-clad cable.

C. Wiring connectors.

D. Electrical tape.

E. Oxide inhibiting compound.

F. Wire pulling lubricant.

G. Cable ties.

### 1.02 RELATED REQUIREMENTS

A. Section 07 8400 - Firestopping.

B. Section 26 0526 - Grounding and Bonding for Electrical Systems: Additional requirements for grounding conductors and grounding connectors.

C. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.

### 1.03 REFERENCE STANDARDS

A. ASTM B3 - Standard Specification for Soft or Annealed Copper Wire; 2013.

B. ASTM B8 - Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft; 2011 (Reapproved 2017).

C. ASTM B33 - Standard Specification for Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes; 2010 (Reapproved 2014).

D. ASTM B787/B787M - Standard Specification for 19 Wire Combination Unilay-Stranded Copper Conductors for Subsequent Insulation; 2004 (Reapproved 2014).

E. ASTM D3005 - Standard Specification for Low-Temperature Resistant Vinyl Chloride Plastic Pressure-Sensitive Electrical Insulating Tape; 2017.

F. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.

G. NECA 120 - Standard for Installing Armored Cable (AC) and Metal-Clad Cable (MC); 2012.

H. NEMA WC 70 - Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy; 2009.

I. NETA ATS - Acceptance Testing Specifications for Electrical Power Equipment and Systems; 2013.

J. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

K. UL 44 - Thermoset-Insulated Wires and Cables; Current Edition, Including All Revisions.

L. UL 83 - Thermoplastic-Insulated Wires and Cables; Current Edition, Including All Revisions.

M. UL 183 - Manufactured Wiring Systems; Current Edition, Including All Revisions.

N. UL 486A-486B - Wire Connectors; Current Edition, Including All Revisions.

O. UL 486C - Splicing Wire Connectors; Current Edition, Including All Revisions.

P. UL 510 - Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape; Current Edition, Including All Revisions.

Q. UL 1569 - Metal-Clad Cables; Current Edition, Including All Revisions.

## 1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate sizes of raceways, boxes, and equipment enclosures installed under other sections with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
   2. Coordinate with electrical equipment installed under other sections to provide terminations suitable for use with the conductors to be installed.
   3. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

# PART 2 PRODUCTS

## 2.01 CONDUCTOR AND CABLE APPLICATIONS

A. Do not use conductors and cables for applications other than as permitted by NFPA 70 and product listing.

B. Provide single conductor building wire installed in suitable raceway unless otherwise indicated, permitted, or required.

C. Nonmetallic-sheathed cable is not permitted.

D. Underground feeder and branch-circuit cable is not permitted.

E. Service entrance cable is not permitted.

F. Armored cable is not permitted.

G. Manufactured wiring systems are permitted only as follows:
   1. Where not otherwise restricted, may be used:
      a. For wiring of sales area highbay lighting.
   2. In addition to other applicable restrictions, may not be used:
      a. Where not approved for use by the authority having jurisdiction.

## 2.02 CONDUCTOR AND CABLE GENERAL REQUIREMENTS

A. Provide products that comply with requirements of NFPA 70.

B. Provide products listed, classified, and labeled as suitable for the purpose intended.

C. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, etc. as required for a complete operating system.

D. Comply with NEMA WC 70.

E. Thermoplastic-Insulated Conductors and Cables: Listed and labeled as complying with UL 83.

F. Thermoset-Insulated Conductors and Cables: Listed and labeled as complying with UL 44.

G. Conductors for Grounding and Bonding: Also comply with Section 26 0526.

H. Conductor Material:
   1. Provide copper conductors only. Aluminum conductors are not acceptable for this project. Conductor sizes indicated are based on copper.
   2. Copper Conductors: Soft drawn annealed, 98 percent conductivity, uncoated copper conductors complying with ASTM B3, ASTM B8, or ASTM B787/B787M unless otherwise indicated.
   3. Tinned Copper Conductors: Comply with ASTM B33.

I. Minimum Conductor Size:
   1. Branch Circuits: 12 AWG.
      a. Exceptions:
         1) Minimum size shall be adjusted as required due to voltage drop along length of branch circuit.
   2. Control Circuits: 14 AWG.

J. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

K. Conductor Color Coding:
   1. Color code conductors as indicated unless otherwise required by the authority having jurisdiction. Maintain consistent color coding throughout project.
   2. Color Coding Method: Integrally colored insulation.
      a. Conductors size 4 AWG and larger may have black insulation color coded using vinyl color coding electrical tape.
   3. Color Code:
      a. 480Y/277 V, 3 Phase, 4 Wire System:
         1) Phase A: Brown.
         2) Phase B: Orange.
         3) Phase C: Yellow.
         4) Neutral/Grounded: Gray.
      b. 208Y/120 V, 3 Phase, 4 Wire System:
         1) Phase A: Black.
         2) Phase B: Red.
         3) Phase C: Blue.
         4) Neutral/Grounded: White.
      c. Equipment Ground, All Systems: Green.
      d. Isolated Ground, All Systems: Green with yellow stripe.
      e. Travelers for 3-Way and 4-Way Switching: Pink.
      f. For control circuits, comply with manufacturer's recommended color code.

## 2.03 SINGLE CONDUCTOR BUILDING WIRE

A. Manufacturers:
   1. Copper Building Wire:
      a. Cerro Wire LLC: www.cerrowire.com.
      b. Encore Wire Corporation: www.encorewire.com.
      c. Southwire Company: www.southwire.com.

B. Description: Single conductor insulated wire.

C. Conductor Stranding:
   1. Feeders and Branch Circuits:
      a. Size 10 AWG and Smaller: Solid.
      b. Size 8 AWG and Larger: Stranded.
   2. Control Circuits: Stranded.

D. Insulation Voltage Rating: 600 V.

E. Insulation:
   1. Copper Building Wire: Type THHN/THWN or THHN/THWN-2, except as indicated below.

## 2.04 METAL-CLAD CABLE

A. Manufacturers:
   1. AFC Cable Systems Inc: www.afcweb.com.
   2. Encore Wire Corporation: www.encorewire.com.
   3. Southwire Company: www.southwire.com.

B. Description: NFPA 70, Type MC cable listed and labeled as complying with UL 1569, and listed for use in classified firestop systems to be used.

C. Conductor Stranding:
   1. Size 10 AWG and Smaller: Solid.
   2. Size 8 AWG and Larger: Stranded.

D. Insulation Voltage Rating: 600 V.

E. Insulation: Type THHN, THHN/THWN, or THHN/THWN-2.

F. Provide dedicated neutral conductor for each phase conductor where indicated or required.

G. Grounding: Full-size integral equipment grounding conductor.

1. Provide additional isolated/insulated grounding conductor where indicated or required.

H. Armor: Steel, interlocked tape.

## 2.05 MANUFACTURED WIRING SYSTEMS

A. Manufacturers:
   1. Manufactured wiring system and all associated components provided by Dick's Sporting Goods vendor.

B. Description: Manufactured wiring assemblies complying with NFPA 70 Article 604, and listed and labeled as complying with UL 183.

C. Connectors: Keyed and color-coded to prevent interconnection of different voltages.

## 2.06 WIRING CONNECTORS

A. Description: Wiring connectors appropriate for the application, suitable for use with the conductors to be connected, and listed as complying with UL 486A-486B or UL 486C as applicable.

B. Connectors for Grounding and Bonding: Comply with Section 26 0526.

C. Wiring Connectors for Splices and Taps:
   1. Copper Conductors Size 10 AWG and Smaller: Use insulated spring wire connectors with plastic caps for splices and taps.
   2. Copper Conductors Size 8 AWG and Smaller: Use solderless pressure connectors with insulated covers for splices and taps.
   3. Copper Conductors Size 6 AWG and Larger: Use split bolt connectors for splices and taps. Tape unisulated conductors and connectors with electrical tape to 150 percent of insulation rating of conductor..
   4. Make splices, taps and terminations to carry full ampacity of conductors with no perceptible temperature rise.

D. Wiring Connectors for Terminations:
   1. Provide terminal lugs for connecting conductors to equipment furnished with terminations designed for terminal lugs.
   2. Where over-sized conductors are larger than the equipment terminations can accommodate, provide connectors suitable for reducing to appropriate size, but not less than required for the rating of the overcurrent protective device.

## 2.07 WIRING ACCESSORIES

A. Electrical Tape:
   1. Vinyl Color Coding Electrical Tape: Integrally colored to match color code indicated; listed as complying with UL 510; minimum thickness of 7 mil (0.18 mm); resistant to abrasion, corrosion, and sunlight; suitable for continuous temperature environment up to 221 degrees F (105 degrees C).
   2. Vinyl Insulating Electrical Tape: Complying with ASTM D3005 and listed as complying with UL 510; minimum thickness of 7 mil (0.18 mm); resistant to abrasion, corrosion, and sunlight; conformable for application down to 0 degrees F (-18 degrees C) and suitable for continuous temperature environment up to 221 degrees F (105 degrees C).

B. Oxide Inhibiting Compound: Listed; suitable for use with the conductors or cables to be installed.

C. Wire Pulling Lubricant: Listed; suitable for use with the conductors or cables to be installed and suitable for use at the installation temperature.

D. Cable Ties: Material and tensile strength rating suitable for application.

# PART 3 EXECUTION

## 3.01 EXAMINATION

A. Verify that interior of building has been protected from weather.

B. Verify that work likely to damage wire and cable has been completed.

C. Verify that raceways, boxes, and equipment enclosures are installed and are properly sized to accommodate conductors and cables in accordance with NFPA 70.

D. Verify that field measurements are as indicated.

E. Verify that conditions are satisfactory for installation prior to starting work.

**3.02 PREPARATION**

A. Clean raceways thoroughly to remove foreign materials before installing conductors and cables.

**3.03 INSTALLATION**

A. Circuiting Requirements:
   1. Unless dimensioned, circuit routing indicated is diagrammatic.
   2. When circuit destination is indicated without specific routing, determine exact routing required.
   3. Arrange circuiting to minimize splices.
   4. All locations: Metal clad cable may be used for branch circuits in dry locations where concealed if approved by the owner, landlord and local code official prior to bid. All other branch circuits and feeders shall use building wire installed in raceway.
   5. Underground Installations: Use only building wire installed in raceway, except where noted otherwise in specifications.
   6. Use wiring methods indicated. Unless otherwise noted, all wiring shall be installed in conduit.
   7. Include circuit lengths required to install connected devices within 10 ft (3.0 m) of location indicated.

B. Install products in accordance with manufacturer's instructions.

C. Perform work in accordance with NECA 1 (general workmanship).

D. Install metal-clad cable (Type MC) in accordance with NECA 120.

E. Installation in Raceway:
   1. Tape ends of conductors and cables to prevent infiltration of moisture and other contaminants.
   2. Pull all conductors and cables together into raceway at same time.
   3. Do not damage conductors and cables or exceed manufacturer's recommended maximum pulling tension and sidewall pressure.
   4. Use suitable wire pulling lubricant where necessary, except when lubricant is not recommended by the manufacturer.

F. Paralleled Conductors: Install conductors of the same length and terminate in the same manner.

G. Secure and support conductors and cables in accordance with NFPA 70 using suitable supports and methods approved by the authority having jurisdiction. Provide independent support from building structure. Do not provide support from raceways, piping, ductwork, or other systems.
   1. Installation Above Suspended Ceilings (as allowed by other sections): Use metal spring clips or plastic cable ties to support cables from structure. Do not provide support from ceiling support system. Do not provide support from ceiling grid or allow conductors and cables to lay on ceiling tiles.

H. Terminate cables using suitable fittings.
   1. Metal-Clad Cable (Type MC):
      a. Use listed fittings.
      b. Cut cable armor only using specialized tools to prevent damaging conductors or insulation. Do not use hacksaw or wire cutters to cut armor.

I. Install conductors with a minimum of 12 inches (300 mm) of slack at each outlet.

J. Neatly train and bundle conductors inside boxes, wireways, panelboards and other equipment enclosures.

K. Group or otherwise identify neutral/grounded conductors with associated ungrounded conductors inside enclosures in accordance with NFPA 70.

L. Make wiring connections using specified wiring connectors.
   1. Make splices and taps only in accessible boxes. Do not pull splices into raceways or make splices in conduit bodies or wiring gutters.
   2. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors.
   3. Do not remove conductor strands to facilitate insertion into connector.
   4. Clean contact surfaces on conductors and connectors to suitable remove corrosion, oxides, and other contaminates. Do not use wire brush on plated connector surfaces.
   5. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
   6. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.

M. Insulate splices and taps that are made with uninsulated connectors using methods suitable for the application, with insulation and mechanical strength to at least 150 percent of insulation rating of conductors.

N. Insulate ends of spare conductors using vinyl insulating electrical tape.

O. Field-Applied Color Coding: Where vinyl color coding electrical tape is used in lieu of integrally colored insulation as permitted in Part 2 under "Color Coding", apply half overlapping turns of tape at each termination and at each location conductors are accessible.

P. Identify conductors and cables in accordance with Section 26 0553.

Q. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 8400.

R. Unless specifically indicated to be excluded, provide final connections to all equipment and devices, including those furnished by others, as required for a complete operating system.

**3.04 FIELD QUALITY CONTROL**

A. See Section 01 4000 - Quality Requirements, for additional requirements.

B. Inspect and test in accordance with NETA ATS, except Section 4.

C. Inspect wire and cable for physical damage and proper connection.

D. Measure tightness of bolted connections and compare torque measurements with manufacturer's recommended values.

E. Verify continuity of each branch circuit conductor and of all system and control wiring.

F. Perform inspections and tests listed in NETA ATS, Section 7.3.2. The insulation resistance test is required for all conductors. The resistance test for parallel conductors listed as optional is not required.

G. Correct deficiencies and replace damaged or defective conductors and cables.

**END OF SECTION**

## SECTION 26 0526

## GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Grounding and bonding requirements.

B. Conductors for grounding and bonding.

C. Connectors for grounding and bonding.

D. Ground bars.

E. Ground rod electrodes.

### 1.02 RELATED REQUIREMENTS

A. Section 26 0519 - Low-Voltage Electrical Power Conductors and Cables: Additional requirements for conductors for grounding and bonding, including conductor color coding.

B. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.

C. Section 26 5600 - Exterior Lighting: Additional grounding and bonding requirements for pole-mounted luminaires.

### 1.03 REFERENCE STANDARDS

A. IEEE 81 - IEEE Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Grounding System; 2012.

B. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.

C. NEMA GR 1 - Grounding Rod Electrodes and Grounding Rod Electrode Couplings; 2007.

D. NETA ATS - Acceptance Testing Specifications for Electrical Power Equipment and Systems; 2013.

E. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

F. UL 467 - Grounding and Bonding Equipment; Current Edition, Including All Revisions.

### 1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Verify exact locations of underground metal water service pipe entrances to building.
   2. Coordinate the work with other trades to provide steel reinforcement complying with specified requirements for concrete-encased electrode.
   3. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

B. Sequencing:
   1. Do not install ground rod electrodes until final backfill and compaction is complete.

### 1.05 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

### 1.06 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

### PART 2 PRODUCTS

### 2.01 GROUNDING AND BONDING REQUIREMENTS

A. Existing Work: Where existing grounding and bonding system components are indicated to be reused, they may be reused only where they are free from corrosion, integrity and continuity are verified, and where acceptable to the authority having jurisdiction.

B. Do not use products for applications other than as permitted by NFPA 70 and product listing.

C. Unless specifically indicated to be excluded, provide all required components, conductors, connectors, conduit, boxes, fittings, supports, accessories, etc. as necessary for a complete grounding and bonding system.

D. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

E. Grounding System Resistance:
   1. Achieve specified grounding system resistance under normally dry conditions unless otherwise approved by Architect. Precipitation within the previous 48 hours does not constitute normally dry conditions.
   2. Grounding Electrode System: Not greater than 5 ohms to ground, when tested according to IEEE 81 using "fall-of-potential" method.
   3. Between Grounding Electrode System and Major Electrical Equipment Frames, System Neutral, and Derived Neutral Points: Not greater than 0.5 ohms, when tested using "point-to-point" methods.

F. Grounding Electrode System:
   1. Provide connection to required and supplemental grounding electrodes indicated to form grounding electrode system.
      a. Provide continuous grounding electrode conductors without splice or joint.
      b. Install grounding electrode conductors in raceway where exposed to physical damage. Bond grounding electrode conductor to metallic raceways at each end with bonding jumper.
   2. Metal Underground Water Pipe(s):
      a. Provide connection to underground metal domestic and fire protection (where present) water service pipe(s) that are in direct contact with earth for at least 10 feet (3.0 m) at an accessible location not more than 5 feet (1.5 m) from the point of entrance to the building.
      b. Provide bonding jumper(s) around insulating joints/pipes as required to make pipe electrically continuous.
      c. Provide bonding jumper around water meter of sufficient length to permit removal of meter without disconnecting jumper.
   3. Metal Frame of the Building
      a. Provide connection to building frame steel.
   4. Concrete-Encased Electrode:
      a. Provide connection to concrete-encased electrode consisting of not less than 20 feet (6.0 m) of either steel reinforcing bars or bare copper conductor not smaller than 4 AWG embedded within concrete foundation or footing that is in direct contact with earth in accordance with NFPA 70.
   5. Ground Rod Electrode(s):
      a. Provide single electrode unless otherwise indicated or required.
      b. Space electrodes not less than 10 feet (3.0 m) from each other and any other ground electrode.
      c. Where location is not indicated, locate electrode(s) at least 5 feet (1.5 m) outside building perimeter foundation as near as possible to electrical service entrance; where possible, locate in softscape (uncovered) area.
      d. Provide ground enhancement material around electrode where indicated.
   6. Provide additional ground electrode(s) as required to achieve specified grounding electrode system resistance.
   7. Ground Bar: Provide ground bar, separate from service equipment enclosure, for common connection point of grounding electrode system bonding jumpers as permitted in NFPA 70. Connect grounding electrode conductor provided for service-supplied system grounding to this ground bar.
      a. Ground Bar Size: 1/4 by 2 by 12 inches (6 by 50 by 300 mm) unless otherwise indicated or required.

b. Where ground bar location is not indicated, locate in accessible location as near as possible to service disconnect enclosure.
c. Ground Bar Mounting Height: 18 inches (450 mm) above finished floor unless otherwise indicated.

G. Service-Supplied System Grounding:
1. For each service disconnect, provide grounding electrode conductor to connect neutral (grounded) service conductor to grounding electrode system. Unless otherwise indicated, make connection at neutral (grounded) bus in service disconnect enclosure.
2. For each service disconnect, provide main bonding jumper to connect neutral (grounded) bus to equipment ground bus where not factory-installed. Do not make any other connections between neutral (grounded) conductors and ground on load side of service disconnect.

H. Separately Derived System Grounding:
1. Separately derived systems include, but are not limited to:
a. Transformers (except autotransformers such as buck-boost transformers).
2. Provide grounding electrode conductor to connect derived system grounded conductor to nearest effectively grounded metal building frame. Unless otherwise indicated, make connection at neutral (grounded) bus in source enclosure.
3. Provide bonding jumper to connect derived system grounded conductor to nearest metal building frame and nearest metal water piping in the area served by the derived system, where not already used as a grounding electrode for the derived system. Make connection at same location as grounding electrode conductor connection.
4. Provide system bonding jumper to connect system grounded conductor to equipment ground bus. Make connection at same location as grounding electrode conductor connection. Do not make any other connections between neutral (grounded) conductors and ground on load side of separately derived system disconnect.
5. Where the source and first disconnecting means are in separate enclosures, provide supply-side bonding jumper between source and first disconnecting means.

I. Bonding and Equipment Grounding:
1. Provide bonding for equipment grounding conductors, equipment ground busses, metallic equipment enclosures, metallic raceways and boxes, device grounding terminals, and other normally non-current-carrying conductive materials enclosing electrical conductors/equipment or likely to become energized as indicated and in accordance with NFPA 70.
2. Provide insulated equipment grounding conductor in each feeder and branch circuit raceway. Do not use raceways as sole equipment grounding conductor.
3. Where circuit conductor sizes are increased for voltage drop, increase size of equipment grounding conductor proportionally in accordance with NFPA 70.
4. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.
5. Terminate branch circuit equipment grounding conductors on solidly bonded equipment ground bus only. Do not terminate on neutral (grounded) or isolated/insulated ground bus.
6. Provide bonding jumper across expansion or expansion/deflection fittings provided to accommodate conduit movement.
7. Provide bonding for interior metal piping systems in accordance with NFPA 70. This includes, but is not limited to:
a. Metal water piping where not already effectively bonded to metal underground water pipe used as grounding electrode.
b. Metal gas piping.
8. Provide bonding for metal siding not effectively bonded through attachment to metal building frame.

J. Isolated Ground System:
1. Where isolated ground receptacles or other isolated ground connections are indicated, provide separate isolated/insulated equipment grounding conductors.

2. Connect isolated/insulated equipment grounding conductors only to separate isolated/insulated equipment ground busses.
3. Connect the isolated/insulated equipment grounding conductors to the solidly bonded equipment ground bus only at the service disconnect or separately derived system disconnect. Do not make any other connections between isolated ground system and normal equipment ground system on the load side of this connection.

K. Communications Systems Grounding and Bonding:
1. Provide intersystem bonding termination at service equipment or metering equipment enclosure and at disconnecting means for any additional buildings or structures in accordance with NFPA 70.
2. Provide bonding jumper in raceway from intersystem bonding termination to each communications room or backboard and provide ground bar for termination.
a. Bonding Jumper Size: 6 AWG, unless otherwise indicated or required.
b. Raceway Size: 3/4 inch (21 mm) trade size unless otherwise indicated or required.
c. Ground Bar Size: 1/4 by 2 by 12 inches (6 by 50 by 300 mm) unless otherwise indicated or required.
d. Ground Bar Mounting Height: 18 inches (450 mm) above finished floor unless otherwise indicated.

## 2.02 GROUNDING AND BONDING COMPONENTS

A. General Requirements:
1. Provide products listed, classified, and labeled as suitable for the purpose intended.
2. Provide products listed and labeled as complying with UL 467 where applicable.

B. Conductors for Grounding and Bonding, in Addition to Requirements of Section 26 0526:
1. Use insulated copper conductors unless otherwise indicated.
a. Exceptions:
1) Use bare copper conductors where installed underground in direct contact with earth.
2) Use bare copper conductors where directly encased in concrete (not in raceway).

C. Connectors for Grounding and Bonding:
1. Description: Connectors appropriate for the application and suitable for the conductors and items to be connected; listed and labeled as complying with UL 467.
2. Unless otherwise indicated, use exothermic welded connections for underground, concealed and other inaccessible connections.
3. Unless otherwise indicated, use mechanical connectors, compression connectors, or exothermic welded connections for accessible connections.
4. Manufacturers - Mechanical and Compression Connectors:
a. Advanced Lightning Technology (ALT): www.altfab.com.
b. Burndy LLC: www.burndy.com.
c. Thomas & Betts Corporation: www.tnb.com.
5. Manufacturers - Exothermic Welded Connections:
a. Burndy LLC: www.burndy.com.
b. Cadweld, a brand of Erico International Corporation: www.erico.com.
c. ThermOweld, a brand of Continental Industries, Inc: www.thermoweld.com.

D. Ground Bars:
1. Description: Copper rectangular ground bars with mounting brackets and insulators.
2. Size: As indicated.
3. Holes for Connections: As indicated or as required for connections to be made.
4. Manufacturers:
a. Advanced Lightning Technology (ALT): www.altfab.com.
b. Erico International Corporation: www.erico.com.
c. ThermOweld, a brand of Continental Industries, Inc: www.thermoweld.com.

E. Ground Rod Electrodes:
   1. Comply with NEMA GR 1.
   2. Material: Copper-bonded (copper-clad) steel.
   3. Size: 3/4 inch (19 mm) diameter by 10 feet (3.0 m) length, unless otherwise indicated.
   4. Manufacturers:
      a. Advanced Lightning Technology (ALT): www.altfab.com.
      b. Erico International Corporation: www.erico.com.
      c. Galvan Industries, Inc: www.galvanelectrical.com.

F. Ground Enhancement Material:
   1. Description: Factory-mixed conductive material designed for permanent and maintenance-free improvement of grounding effectiveness by lowering resistivity.
   2. Manufacturers:
      a. Erico International Corporation: www.erico.com.
      b. Harger Lightning & Grounding: www.harger.com.
      c. thermOweldae, subsidiary of Continental Industries; division of Burndy LLC: www.thermoweld.com.

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verify that work likely to damage grounding and bonding system components has been completed.

B. Verify that field measurements are as indicated.

C. Verify that conditions are satisfactory for installation prior to starting work.

### 3.02 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Install all grounding components at locations required by local authority having jurisdiction.

C. Perform work in accordance with NECA 1 (general workmanship).

D. Ground Rod Electrodes: Unless otherwise indicated, install ground rod electrodes vertically. Where encountered rock prohibits vertical installation, install at 45 degree angle or bury horizontally in trench at least 30 inches (750 mm) deep in accordance with NFPA 70 or provide ground plates.

E. Make grounding and bonding connections using specified connectors.
   1. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors. Do not remove conductor strands to facilitate insertion into connector.
   2. Remove nonconductive paint, enamel, or similar coating at threads, contact points, and contact surfaces.
   3. Exothermic Welds: Make connections using molds and weld material suitable for the items to be connected in accordance with manufacturer's recommendations.
   4. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
   5. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.

F. Identify grounding and bonding system components in accordance with Section 26 0553.

G. Provide bonding of shielding cable serving fire alarm addressable adapter module on all exterior equipment. Provide bonding of exterior equipment device lugs.

### 3.03 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for additional requirements.

B. Inspect and test in accordance with NETA ATS except Section 4.

C. Perform inspections and tests listed in NETA ATS, Section 7.13.

D. Perform ground electrode resistance tests under normally dry conditions. Precipitation within the previous 48 hours does not constitute normally dry conditions.

E. Inspect grounding and bonding system conductors and connections for tightness and proper installation.

F. Investigate and correct deficiencies where measured ground resistances do not comply with specified requirements.

**END OF SECTION**

## SECTION 26 0529

## HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Support and attachment components for equipment, conduit, cable, boxes, and other electrical work.

### 1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Concrete equipment pads.

B. Section 26 0533.13 - Conduit for Electrical Systems: Additional support and attachment requirements for conduits.

C. Section 26 0533.16 - Boxes for Electrical Systems: Additional support and attachment requirements for boxes.

D. Section 26 5100 - Interior Lighting: Additional support and attachment requirements for interior luminaires.

E. Section 26 5600 - Exterior Lighting: Additional support and attachment requirements for exterior luminaires.

### 1.03 REFERENCE STANDARDS

A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.

C. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel; 2015.

D. MFMA-4 - Metal Framing Standards Publication; 2004.

E. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.

F. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

### 1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate sizes and arrangement of supports and bases with the actual equipment and components to be installed.
   2. Coordinate the work with other trades to provide additional framing and materials required for installation.
   3. Coordinate compatibility of support and attachment components with mounting surfaces at the installed locations.
   4. Coordinate the arrangement of supports with ductwork, piping, equipment and other potential conflicts installed under other sections or by others.
   5. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

B. Sequencing:
   1. Do not install products on or provide attachment to concrete surfaces until concrete has fully cured in accordance with Section 03 3000.

### 1.05 QUALITY ASSURANCE

A. Comply with NFPA 70.

B. Comply with applicable building code.

## PART 2 PRODUCTS

### 2.01 SUPPORT AND ATTACHMENT COMPONENTS

A. General Requirements:
   1. Provide all required hangers, supports, anchors, fasteners, fittings, accessories, and hardware as necessary for the complete installation of electrical work.
   2. Provide products listed, classified, and labeled as suitable for the purpose intended, where applicable.
   3. Where support and attachment component types and sizes are not indicated, select in accordance with manufacturer's application criteria as required for the load to be supported. Include consideration for vibration, equipment operation, and shock loads where applicable.
   4. Do not use products for applications other than as permitted by NFPA 70 and product listing.
   5. Steel Components: Use corrosion resistant materials suitable for the environment where installed.
      a. Indoor Dry Locations: Use zinc-plated steel or approved equivalent unless otherwise indicated.
      b. Outdoor and Damp or Wet Indoor Locations: Use galvanized steel, stainless steel, or approved equivalent unless otherwise indicated.
      c. Zinc-Plated Steel: Electroplated in accordance with ASTM B633.
      d. Galvanized Steel: Hot-dip galvanized after fabrication in accordance with ASTM A123/A123M or ASTM A153/A153M.

B. Conduit and Cable Supports: Straps, clamps, etc. suitable for the conduit or cable to be supported.
   1. Conduit Straps: One-hole or two-hole type; steel or malleable iron.
   2. Conduit Clamps: Bolted type unless otherwise indicated.

C. Outlet Box Supports: Hangers, brackets, etc. suitable for the boxes to be supported.

D. Metal Channel (Strut) Framing Systems: Factory-fabricated continuous-slot metal channel (strut) and associated fittings, accessories, and hardware required for field-assembly of supports.
   1. Comply with MFMA-4.

E. Hanger Rods: Threaded zinc-plated steel unless otherwise indicated.
   1. Minimum Size, Unless Otherwise Indicated or Required:
      a. Equipment Supports: 1/2 inch (13 mm) diameter.
      b. Busway Supports: 1/2 inch (13 mm) diameter.
      c. Single Conduit up to 1 inch (27 mm) trade size: 1/4 inch (6 mm) diameter.
      d. Single Conduit larger than 1 inch (27 mm) trade size: 3/8 inch (10 mm) diameter.
      e. Trapeze Support for Multiple Conduits: 3/8 inch (10 mm) diameter.
      f. Outlet Boxes: 1/4 inch (6 mm) diameter.
      g. Luminaires: 1/4 inch (6 mm) diameter.

F. Anchors and Fasteners:
   1. Unless otherwise indicated and where not otherwise restricted, use the anchor and fastener types indicated for the specified applications.
   2. Concrete Structural Elements: Use preset concrete inserts, expansion anchors, screw anchors, or powder actuated anchors.
   3. Concrete Surfaces: Use self-drilling anchors and expansion anchors.
   4. Solid or Grout-Filled Masonry: Use expansion anchors or screw anchors.
   5. Hollow Masonry, Plaster and Gypsum Board Partitions: Use toggle bolts or hollow wall fasteners.
   6. Hollow Stud Walls: Use toggle bolts.
   7. Steel: Use beam clamps, machine bolts, or welded threaded studs.
   8. Sheet Metal: Use sheet metal screws.

9. Wood: Use wood screws.
10. Powder-actuated fasteners are permitted only as follows:
    a. Obtain permission from Architect / Engineer before using powder-actuated anchors.
11. Preset Concrete Inserts: Continuous metal channel (strut) and spot inserts specifically designed to be cast in concrete ceilings, walls, and floors.
    a. Comply with MFMA-4.
    b. Channel Material: Use galvanized steel.
    c. Manufacturer: Same as manufacturer of metal channel (strut) framing system.

## PART 3 EXECUTION

### 3.01 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Perform work in accordance with NECA 1 (general workmanship).

C. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.

D. Unless specifically indicated or approved by Architect, do not provide support from suspended ceiling support system or ceiling grid.

E. Unless specifically indicated or approved by Architect, do not provide support from roof deck.

F. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.

G. Do not use spring steel clips and clamps.

H. Equipment Support and Attachment:
1. Fabricate supports from structural steel or formed steel members to support equipment as required. Rigidly weld members or use hexagon-head bolts to present neat appearance with adequate strength and rigidity. Use spring lock washers under all nuts.
2. Use metal channel (strut) secured to studs to support equipment surface-mounted on hollow stud walls when wall strength is not sufficient to resist pull-out.
3. Use metal channel (strut) to support surface-mounted equipment in wet or damp locations to provide 1 inch (25 mm) space between equipment and mounting surface.
4. Securely fasten floor-mounted equipment. Do not install equipment such that it relies on its own weight for support.
5. Install surface-mounted cabinets and panelboards with minimum of four anchors.
6. Use sheet metal channel to bridge studs above and below cabinets and panelboards recessed in hollow partitions.

I. Conduit Support and Attachment: Also comply with Section 26 0533.13.

J. Box Support and Attachment: Also comply with Section 26 0533.16.

K. Interior Luminaire Support and Attachment: Also comply with Section 26 5100.

L. Exterior Luminaire Support and Attachment: Also comply with Section 26 5600.

M. Preset Concrete Inserts: Use manufacturer provided closure strips to inhibit concrete seepage during concrete pour.

N. Secure fasteners according to manufacturer's recommended torque settings.

O. Remove temporary supports.

P. Identify independent electrical component support wires above accessible ceilings (only where specifically indicated or permitted) with color distinguishable from ceiling support wires in accordance with NFPA 70.

### 3.02 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for additional requirements.

B. Inspect support and attachment components for damage and defects.

C. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.

D. Correct deficiencies and replace damaged or defective support and attachment components.

**END OF SECTION**

**SECTION 26 0533.13**

**CONDUIT FOR ELECTRICAL SYSTEMS**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Galvanized steel rigid metal conduit (RMC).

B. Aluminum rigid metal conduit (RMC).

C. Intermediate metal conduit (IMC).

D. PVC-coated galvanized steel rigid metal conduit (RMC).

E. Flexible metal conduit (FMC).

F. Liquidtight flexible metal conduit (LFMC).

G. Electrical metallic tubing (EMT).

H. Rigid polyvinyl chloride (PVC) conduit.

I. Electrical nonmetallic tubing (ENT).

J. Liquidtight flexible nonmetallic conduit (LFNC).

K. Conduit fittings.

L. Accessories.

### 1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Concrete encasement of conduits.

B. Section 07 8400 - Firestopping.

C. Section 26 0519 - Low-Voltage Electrical Power Conductors and Cables: Metal clad cable (Type MC), armored cable (Type AC), and manufactured wiring systems, including uses permitted.

D. Section 26 0526 - Grounding and Bonding for Electrical Systems.
   1. Includes additional requirements for fittings for grounding and bonding.

E. Section 26 0529 - Hangers and Supports for Electrical Systems.

F. Section 26 0533.16 - Boxes for Electrical Systems.

G. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.

H. Section 26 2100 - Low-Voltage Electrical Service Entrance: Additional requirements for electrical service conduits.

I. 27 0741 - Telephone / Data / POS Service, Pathways and Wiring: Additional requirements for communications systems conduits.

### 1.03 REFERENCE STANDARDS

A. ANSI C80.1 - American National Standard for Electrical Rigid Steel Conduit (ERSC); 2015.

B. ANSI C80.3 - American National Standard for Electrical Metallic Tubing -- Steel (EMT-S); 2015.

C. ANSI C80.5 - American National Standard for Electrical Rigid Metal Conduit -- Aluminum (ERMC-A); 2015.

D. ANSI C80.6 - American National Standard for Electrical Intermediate Metal Conduit (EIMC); 2005.

E. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.

F. NECA 101 - Standard for Installing Steel Conduits (Rigid, IMC, EMT); 2013.

G. NECA 102 - Standard for Installing Aluminum Rigid Metal Conduit; 2004.

H. NECA 111 - Standard for Installing Nonmetallic Raceways (RNC, ENT, LFNC); 2003.

I. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; 2014.

J. NEMA RN 1 - Polyvinyl-Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit; 2005 (R2013).

K. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Conduit; 2013.

L. NEMA TC 3 - Polyvinyl Chloride (PVC) Fittings for Use with Rigid PVC Conduit and Tubing; 2015.

M. NEMA TC 13 - Electrical Nonmetallic Tubing (ENT); 2014.

N. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

O. UL 1 - Flexible Metal Conduit; Current Edition, Including All Revisions.

P. UL 6 - Electrical Rigid Metal Conduit-Steel; Current Edition, Including All Revisions.

Q. UL 6A - Electrical Rigid Metal Conduit-Aluminum, Red Brass, and Stainless Steel; Current Edition, Including All Revisions.

R. UL 360 - Liquid-Tight Flexible Steel Conduit; Current Edition, Including All Revisions.

S. UL 514B - Conduit, Tubing, and Cable Fittings; Current Edition, Including All Revisions.

T. UL 651 - Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings; Current Edition, Including All Revisions.

U. UL 797 - Electrical Metallic Tubing-Steel; Current Edition, Including All Revisions.

V. UL 1242 - Electrical Intermediate Metal Conduit-Steel; Current Edition, Including All Revisions.

W. UL 1653 - Electrical Nonmetallic Tubing; Current Edition, Including All Revisions.

X. UL 1660 - Liquid-Tight Flexible Nonmetallic Conduit; Current Edition, Including All Revisions.

## 1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate minimum sizes of conduits with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
   2. Coordinate the arrangement of conduits with structural members, ductwork, piping, equipment and other potential conflicts installed under other sections or by others.
   3. Verify exact conduit termination locations required for boxes, enclosures, and equipment installed under other sections or by others.
   4. Coordinate the work with other trades to provide roof penetrations that preserve the integrity of the roofing system and do not void the roof warranty.
   5. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

B. Sequencing:
   1. Do not begin installation of conductors and cables until installation of conduit is complete between outlet, junction and splicing points.

## 1.05 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

## 1.06 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store conduit and fittings in accordance with manufacturer's instructions.

B. Accept conduit on site. Inspect for damage.

C. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.

D. Protect PVC conduit from sunlight.

## 1.07 PROJECT CONDITIONS

A. For dimensions shown on Drawings, verify that field measurements are as shown on Drawings.

B. Verify routing and termination locations of conduit prior to rough-in.

C. Conduit routing is shown on Drawings in approximate locations unless dimensioned. Route as required to complete wiring system. Unless noted otherwise, all conduit shall be concealed. where shown exposed, conceal in walls at maximum height possible for runs to flush device boxes.

# PART 2 PRODUCTS

## 2.01 CONDUIT APPLICATIONS

A. Do not use conduit and associated fittings for applications other than as permitted by NFPA 70 and product listing.

B. Unless otherwise indicated and where not otherwise restricted, use the conduit types indicated for the specified applications. Where more than one listed application applies, comply with the most restrictive requirements. Where conduit type for a particular application is not specified, request clarification from Architect.

C. Underground:
   1. Under Slab on Grade: Use galvanized steel rigid metal conduit, intermediate metal conduit (IMC), PVC-coated galvanized steel rigid metal conduit, or rigid PVC conduit.
   2. Exterior, Direct-Buried: Use galvanized steel rigid metal conduit, intermediate metallic conduit (IMC), PVC-coated galvanized steel rigid metal conduit, or rigid PVC conduit.
   3. Exterior, Embedded Within Concrete: Use galvanized steel rigid metal conduit, intermediate metal conduit (IMC), PVC-coated galvanized steel rigid metal conduit, or rigid PVC conduit.
   4. Where rigid polyvinyl (PVC) conduit is provided, transition to galvanized steel rigid metal conduit when within 5 feet of foundation wall or where emerging from underground.
   5. Where rigid polyvinyl (PVC) conduit larger than 2 inch (53 mm) trade size is provided, use galvanized steel rigid metal conduit elbows for bends.
   6. Where steel conduit is installed in direct contact with earth where soil has a resistivity of less than 2000 ohm-centimeters or is characterized as severely corrosive based on soils report or local experience, use corrosion protection tape to provide supplementary corrosion protection or use PVC-coated galvanized steel rigid metal conduit.
   7. Where steel conduit emerges from concrete into soil, use corrosion protection tape to provide supplementary corrosion protection for a minimum of 4 inches (100 mm) on either side of where conduit emerges or use PVC-coated galvanized steel rigid metal conduit.

D. Concealed Within Masonry Walls: Use galvanized steel rigid metal conduit, intermediate metal conduit (IMC), or electrical metallic tubing (EMT).

E. Concealed Within Hollow Stud Walls: Use galvanized steel rigid metal conduit, intermediate metal conduit (IMC), electrical metallic tubing (EMT), or MC Cable.

F. Concealed Above Accessible Ceilings: Use galvanized steel rigid metal conduit, intermediate metal conduit (IMC), electrical metallic tubing (EMT), or MC Cable.

G. Interior, Damp or Wet Locations: Use galvanized steel rigid metal conduit, intermediate metal conduit (IMC), PVC-coated galvanized steel rigid metal conduit, or electrical metallic tubing (EMT).

H. Exposed, Interior, Not Subject to Physical Damage: Use galvanized steel rigid metal conduit, intermediate metal conduit (IMC), or electrical metallic tubing (EMT).

I. Exposed, Interior, Subject to Physical Damage: Use galvanized steel rigid metal conduit or intermediate metal conduit (IMC).

J. Exposed, Exterior: Use galvanized steel rigid metal conduit, intermediate metal conduit (IMC), or PVC-coated galvanized steel rigid metal conduit.

K. Connections to Luminaires Above Accessible Ceilings: Use flexible metal conduit or MC Cable.

1. Maximum Length: 6 feet (1.8 m).

L. Connections to Vibrating Equipment:
   1. Dry Locations: Use flexible metal conduit.
   2. Damp, Wet, or Corrosive Locations: Use liquidtight flexible metal conduit.
   3. Maximum Length: 6 feet (1.8 m) unless otherwise indicated.
   4. Vibrating equipment includes, but is not limited to:
      a. Transformers.
      b. Motors.

**2.02 CONDUIT REQUIREMENTS**

A. Electrical Service Conduits: Also comply with Section 26 2100.

B. Communications Systems Conduits: Also comply with Section 27 0741.

C. Fittings for Grounding and Bonding: Also comply with Section 26 0526.

D. Provide all conduit, fittings, supports, and accessories required for a complete raceway system.

E. Provide products listed, classified, and labeled as suitable for the purpose intended.

F. Minimum Conduit Size, Unless Otherwise Indicated:
   1. Branch Circuits: 1/2 inch (16 mm) trade size.
   2. Underground, Interior: 3/4 inch (21 mm) trade size.
   3. Underground, Exterior: 1 inch (27 mm) trade size.

G. Where conduit size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

**2.03 GALVANIZED STEEL RIGID METAL CONDUIT (RMC)**

A. Manufacturers:
   1. Allied Tube & Conduit: www.alliedeg.com.
   2. Republic Conduit: www.republic-conduit.com.
   3. Wheatland Tube Company: www.wheatland.com.

B. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit complying with ANSI C80.1 and listed and labeled as complying with UL 6.

C. Fittings:
   1. Manufacturers:
      a. Bridgeport Fittings Inc: www.bptfittings.com.
      b. O-Z/Gedney, a brand of Emerson Industrial Automation: www.emersonindustrial.com.
      c. Thomas & Betts Corporation: www.tnb.com.
   2. Non-Hazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
   3. Material to match conduit.
   4. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.

**2.04 ALUMINUM RIGID METAL CONDUIT (RMC)**

A. Manufacturers:
   1. Allied Tube & Conduit: www.alliedeg.com.
   2. Republic Conduit: www.republic-conduit.com.
   3. Wheatland Tube Company: www.wheatland.com.

B. Description: NFPA 70, Type RMC aluminum rigid metal conduit complying with ANSI C80.5 and listed and labeled as complying with UL 6A.

C. Fittings:
   1. Manufacturers:
      a. Bridgeport Fittings Inc: www.bptfittings.com.

b. O-Z/Gedney, a brand of Emerson Industrial Automation: www.emersonindustrial.com.
c. Thomas & Betts Corporation: www.tnb.com.

2. Non-Hazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
3. Material to match conduit.
4. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.

**2.05 INTERMEDIATE METAL CONDUIT (IMC)**

A. Manufacturers:
1. Allied Tube & Conduit: www.alliedeg.com.
2. Republic Conduit: www.republic-conduit.com.
3. Wheatland Tube Company: www.wheatland.com.

B. Description: NFPA 70, Type IMC galvanized steel intermediate metal conduit complying with ANSI C80.6 and listed and labeled as complying with UL 1242.

C. Fittings:
1. Manufacturers:
a. Bridgeport Fittings Inc: www.bptfittings.com.
b. O-Z/Gedney, a brand of Emerson Industrial Automation: www.emersonindustrial.com.
c. Thomas & Betts Corporation: www.tnb.com.

2. Non-Hazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
3. Material to match conduit.
4. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.

**2.06 PVC-COATED GALVANIZED STEEL RIGID METAL CONDUIT (RMC)**

A. Manufacturers:
1. Thomas & Betts Corporation: www.tnb.com.
2. Robroy Industries: www.robroy.com.

B. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit with external polyvinyl chloride (PVC) coating complying with NEMA RN 1 and listed and labeled as complying with UL 6.

C. Exterior Coating: Polyvinyl chloride (PVC), nominal thickness of 40 mil (1.02 mm).

D. PVC-Coated Fittings:
1. Manufacturer: Same as manufacturer of PVC-coated conduit to be installed.
2. Non-Hazardous Locations: Use fittings listed and labeled as complying with UL 514B.
3. Material to match conduit.
4. Exterior Coating: Polyvinyl chloride (PVC), minimum thickness of 40 mil (1.02 mm).

E. PVC-Coated Supports: Furnish with exterior coating of polyvinyl chloride (PVC), minimum thickness of 15 mil (0.38 mm).

**2.07 FLEXIBLE METAL CONDUIT (FMC)**

A. Manufacturers:
1. AFC Cable Systems, Inc: www.afcweb.com.
2. Electri-Flex Company: www.electriflex.com.
3. International Metal Hose: www.metalhose.com.

B. Description: NFPA 70, Type FMC standard wall steel flexible metal conduit listed and labeled as complying with UL 1, and listed for use in classified firestop systems to be used.

C. Fittings:
1. Manufacturers:

a. Bridgeport Fittings Inc: www.bptfittings.com.
b. O-Z/Gedney, a brand of Emerson Industrial Automation: www.emersonindustrial.com.
c. Thomas & Betts Corporation: www.tnb.com.

2. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
3. Material to match conduit.

**2.08 LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC)**

A. Manufacturers:
1. AFC Cable Systems, Inc: www.afcweb.com.
2. Electri-Flex Company: www.electriflex.com.
3. International Metal Hose: www.metalhose.com.

B. Description: NFPA 70, Type LFMC polyvinyl chloride (PVC) jacketed steel flexible metal conduit listed and labeled as complying with UL 360.

C. Fittings:
1. Manufacturers:
a. Bridgeport Fittings Inc: www.bptfittings.com.
b. O-Z/Gedney, a brand of Emerson Industrial Automation: www.emersonindustrial.com.
c. Thomas & Betts Corporation: www.tnb.com.

2. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
3. Material to match conduit.

**2.09 ELECTRICAL METALLIC TUBING (EMT)**

A. Manufacturers:
1. Allied Tube & Conduit: www.alliedeg.com.
2. Republic Conduit: www.republic-conduit.com.
3. Wheatland Tube Company: www.wheatland.com.

B. Description: NFPA 70, Type EMT steel electrical metallic tubing complying with ANSI C80.3 and listed and labeled as complying with UL 797.

C. Fittings:
1. Manufacturers:
a. Bridgeport Fittings Inc: www.bptfittings.com.
b. O-Z/Gedney, a brand of Emerson Industrial Automation: www.emersonindustrial.com.
c. Thomas & Betts Corporation: www.tnb.com.

2. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
3. Material to match conduit.
4. Connectors and Couplings: Use compression (gland) or set-screw type.
a. Do not use indenter type connectors and couplings.

**2.10 RIGID POLYVINYL CHLORIDE (PVC) CONDUIT**

A. Manufacturers:
1. Cantex Inc: www.cantexinc.com.
2. Carlon, a brand of Thomas & Betts Corporation: www.carlon.com.
3. JM Eagle: www.jmeagle.com.

B. Description: NFPA 70, Type PVC rigid polyvinyl chloride conduit complying with NEMA TC 2 and listed and labeled as complying with UL 651; Schedule 40 unless otherwise indicated, Schedule 80 where subject to physical damage; rated for use with conductors rated 90 degrees C.

C. Fittings:

1. Manufacturer: Same as manufacturer of conduit to be connected.
2. Description: Fittings complying with NEMA TC 3 and listed and labeled as complying with UL 651; material to match conduit.

### 2.11 ELECTRICAL NONMETALLIC TUBING (ENT)

A. Manufacturers:
   1. Cantex Inc: www.cantexinc.com.
   2. Carlon, a brand of Thomas & Betts Corporation: www.carlon.com.

B. Description: NFPA 70, Type ENT electrical nonmetallic tubing complying with NEMA TC 13 and listed and labeled as complying with UL 1653.

C. Fittings:
   1. Manufacturer: Same as manufacturer of ENT to be connected.
   2. Use solvent-welded type fittings.
   3. Solvent-Welded Fittings: Rigid PVC fittings complying with NEMA TC 3 and listed and labeled as complying with UL 651; suitable for use with ENT.

### 2.12 LIQUIDTIGHT FLEXIBLE NONMETALLIC CONDUIT (LFNC)

A. Manufacturers:
   1. AFC Cable Systems, Inc: www.afcweb.com.
   2. Electri-Flex Company: www.electriflex.com.
   3. International Metal Hose: www.metalhose.com.

B. Description: NFPA 70, Type LFNC liquidtight flexible nonmetallic conduit listed and labeled as complying with UL 1660.

C. Fittings:
   1. Manufacturer: Same as manufacturer of conduit to be connected.
   2. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B; suitable for the type of conduit to be connected.

### 2.13 ACCESSORIES

A. Corrosion Protection Tape: PVC-based, minimum thickness of 20 mil (0.51 mm).

B. Conduit Joint Compound: Corrosion-resistant, electrically conductive; suitable for use with the conduit to be installed.

C. Solvent Cement for PVC Conduit and Fittings: As recommended by manufacturer of conduit and fittings to be installed.

D. Pull Strings: Use nylon cord with average breaking strength of not less than 200 pound-force (890 N).

## PART 3 EXECUTION

### 3.01 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Perform work in accordance with NECA 1 (general workmanship).

C. Install galvanized steel rigid metal conduit (RMC) in accordance with NECA 101.

D. Install aluminum rigid metal conduit (RMC) in accordance with NECA 102.

E. Install intermediate metal conduit (IMC) in accordance with NECA 101.

F. Install PVC-coated galvanized steel rigid metal conduit (RMC) using only tools approved by the manufacturer.

G. Install rigid polyvinyl chloride (PVC) conduit in accordance with NECA 111.

H. Install electrical nonmetallic tubing (ENT) in accordance with NECA 111.

I. Install liquidtight flexible nonmetallic conduit (LFNC) in accordance with NECA 111.

J. Conduit Routing:
   1. Unless dimensioned, conduit routing indicated is diagrammatic.

2. Unless specifically indicated to be routed below grade, all conduits shall be routed overhead.
3. When conduit destination is indicated without specific routing, determine exact routing required.
4. Conceal all conduits unless specifically indicated to be exposed.
5. Conduits in the following areas may be exposed, unless otherwise indicated:
    a. Electrical rooms.
    b. Within joists in areas with no ceiling.
6. Conduits installed underground or embedded in concrete may be routed in the shortest possible manner unless otherwise indicated. Route all other conduits parallel or perpendicular to building structure and surfaces, following surface contours where practical.
    a. When overhead conduits runs are exposed, conduits shall be routed along steel members as high as possible.
7. Arrange conduit to maintain adequate headroom, clearances, access and neat appearance.
8. Arrange conduit to provide no more than the equivalent of three 90 degree bends between pull points.
9. Route conduits above water and drain piping where possible.
10. Arrange conduit to prevent moisture traps. Provide drain fittings at low points and at sealing fittings where moisture may collect.
11. Maintain minimum clearance of 6 inches (150 mm) between conduits and piping for other systems.
12. Maintain minimum clearance of 12 inches (300 mm) between conduits and hot surfaces with temperatures exceeding 104 degrees F (40 degrees C).
13. Group parallel conduits in the same area together on a common rack constructed of steel channel. Provide 25% additional spare conduit space when fabricating rack.

K. Conduit Support:
1. Secure and support conduits in accordance with NFPA 70 and Section 26 0529 using suitable supports and methods approved by the authority having jurisdiction.
2. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
3. Arrange supports to prevent misalignment during wiring installation.
4. Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide support from ceiling grid or allow conduits to lay on ceiling tiles.
5. Use coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers and split hangers to support single surface-mounted conduit.
    a. Use clamp back spacer with conduit strap for damp and wet locations to provide space between conduit and mounting surface.
6. Use metal channel (strut) with accessory conduit clamps to support multiple parallel surface-mounted conduits.
7. Use conduit clamp to support single conduit from beam clamp or threaded rod.
8. Use of spring steel conduit clips for support of conduits is not permitted.
9. Use of wire or perforated pipe straps for permanent support of conduits is not permitted. Remove if used for temporary supports after permanent supports are installed.
10. Where conduit support intervals specified in NFPA 70 and NECA standards differ, comply with the most stringent requirements.

L. Connections and Terminations:
1. Use approved zinc-rich paint or conduit joint compound on field-cut threads of galvanized steel conduits prior to making connections.
2. Where two threaded conduits must be joined and neither can be rotated, use three-piece couplings or split couplings. Do not use running threads.
3. Use suitable adapters where required to transition from one type of conduit to another.

4. Provide drip loops for liquidtight flexible conduit connections to prevent drainage of liquid into connectors.
5. Terminate threaded conduits in boxes and enclosures using threaded hubs or double lock nuts for dry locations and raintight hubs for wet locations.
6. Where spare conduits stub up through concrete floors and are not terminated in a box or enclosure, provide threaded couplings equipped with threaded plugs set flush with finished floor.
7. Provide insulating bushings or insulated throats at all conduit terminations to protect conductors.
8. Secure joints and connections to provide maximum mechanical strength and electrical continuity. Bring conduit to shoulder of fittings.
9. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure per manufacturer's recommendations.
10. Make final connection from motor starting switches to motor by means of conductors in flexible steel conduit. Use liquid tight nonmetallic flexible conduit in wet or damp locations only.
11. Where terminating liquid tight flexible metal conduit, fitting assembly shall be sealing type consisting of steel gland, nylon ring and round cone on the outside and a nylon insulated throat fitting on the inside.
12. Where flexible metallic conduit or type MC cable is installed, connectors shall be the die cast MC connectors.
13. Use suitable caps to protect installed conduit against entrance of dirt and moisture.

M. Cut conduit square using saw or pipecutter. De-burr cut ends.

N. Penetrations:
1. Do not penetrate or otherwise notch or cut structural members, including footings and grade beams, without approval of Structural Engineer.
2. Make penetrations perpendicular to surfaces unless otherwise indicated.
3. Provide sleeves for penetrations as indicated or as required to facilitate installation. Set sleeves flush with exposed surfaces unless otherwise indicated or required.
4. Conceal bends for conduit risers emerging above ground.
5. Seal interior of conduits entering the building from underground at first accessible point to prevent entry of moisture and gases.
6. Where conduits penetrate waterproof membrane, seal as required to maintain integrity of membrane.
7. Make penetrations for roof-mounted equipment within associated equipment openings and curbs where possible to minimize roofing system penetrations. Where penetrations are necessary, seal as indicated or as required to preserve integrity of roofing system and maintain roof warranty. Include proposed locations of penetrations and methods for sealing with submittals.
8. Provide metal escutcheon plates for conduit penetrations exposed to public view.
9. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 8400.

O. Underground Installation:
1. Provide trenching and backfilling.
2. Minimum Cover, Unless Otherwise Indicated or Required:
   a. Underground, Exterior: 24 inches (610 mm).
   b. Under Slab on Grade: 12 inches (300 mm) to bottom of slab.
3. Provide underground warning tape in accordance with Section 26 0553 along entire conduit length for service entrance where not concrete-encased.

P. Concrete Encasement: Where conduits not otherwise embedded within concrete are indicated to be concrete-encased, provide concrete in accordance with Section 03 3000 with minimum concrete cover of 3 inches (76 mm) on all sides unless otherwise indicated.

Q. Conduit Movement Provisions: Where conduits are subject to movement, provide expansion and expansion/deflection fittings to prevent damage to enclosed conductors or connected equipment. This includes, but is not limited to:
   1. Where conduits cross structural joints intended for expansion, contraction, deflection or seismic conditions.
   2. Where conduits are subject to earth movement by settlement or frost.

R. Condensation Prevention: Where conduits cross barriers between areas of potential substantial temperature differential, provide sealing fitting or approved sealing compound at an accessible point near the penetration to prevent condensation. This includes, but is not limited to:
   1. Where conduits pass from outdoors into conditioned interior spaces.
   2. Where conduits pass from unconditioned interior spaces into conditioned interior spaces.

S. Provide pull string in all empty conduits and in conduits where conductors and cables are to be installed by others. Leave minimum slack of 12 inches (300 mm) at each end.

T. Provide grounding and bonding in accordance with Section 26 0526.

U. Identify conduits in accordance with Section 26 0553.

V. Coordinate conduit runs with work of other trades.

**3.02 FIELD QUALITY CONTROL**

A. See Section 01 4000 - Quality Requirements, for additional requirements.

B. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.

C. Where coating of PVC-coated galvanized steel rigid metal conduit (RMC) contains cuts or abrasions, repair in accordance with manufacturer's instructions.

D. Correct deficiencies and replace damaged or defective conduits.

**3.03 CLEANING**

A. Clean interior of conduits to remove moisture and foreign matter.

**3.04 PROTECTION**

A. Immediately after installation of conduit, use suitable manufactured plugs to provide protection from entry of moisture and foreign material and do not remove until ready for installation of conductors.

**3.05 INTERFACE WITH OTHER PRODUCTS**

A. Install conduit to preserve fire resistance rating of partitions and other elements. Where multiple penetrations occur, provide a 2 inch separation between sides of conduit. Use approved methods outlines in Division 7.

B. Route conduit through roof openings for piping and ductwork or through suitable roof jack with pitch pocket. Coordinate location with roofing installation specified.

**END OF SECTION**

## SECTION 26 0533.16
## BOXES FOR ELECTRICAL SYSTEMS

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Outlet and device boxes up to 100 cubic inches (1,650 cu cm), including those used as junction and pull boxes.

B. Cabinets and enclosures, including junction and pull boxes larger than 100 cubic inches (1,650 cu cm).

C. Floor boxes.

### 1.02 RELATED REQUIREMENTS

A. Section 07 8400 - Firestopping.

B. Section 08 3100 - Access Doors and Panels: Panels for maintaining access to concealed boxes.

C. Section 26 0526 - Grounding and Bonding for Electrical Systems.

D. Section 26 0529 - Hangers and Supports for Electrical Systems.

E. Section 26 0533.13 - Conduit for Electrical Systems:
   1. Conduit bodies and other fittings.
   2. Additional requirements for locating boxes to limit conduit length and/or number of bends between pulling points.

F. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.

G. Section 26 2726 - Wiring Devices:
   1. Wall plates.
   2. Floor box service fittings.
   3. Additional requirements for locating boxes for wiring devices.

H. Section 26 2813 - Fuses: Spare fuse cabinets.

I. Section 27 0741 - Telephone / Data / POS Service, Pathways and Wiring: Additional requirements for communications systems outlet boxes.

### 1.03 REFERENCE STANDARDS

A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.

B. NECA 130 - Standard for Installing and Maintaining Wiring Devices; 2010.

C. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; 2014.

D. NEMA OS 1 - Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports; 2013.

E. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2014.

F. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

G. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations; Current Edition, Including All Revisions.

H. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations; Current Edition, Including All Revisions.

I. UL 508A - Industrial Control Panels; Current Edition, Including All Revisions.

J. UL 514A - Metallic Outlet Boxes; Current Edition, Including All Revisions.

### 1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances for electrical equipment required by NFPA 70.
2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
3. Coordinate minimum sizes of boxes with the actual installed arrangement of conductors, clamps, support fittings, and devices, calculated according to NFPA 70.
4. Coordinate minimum sizes of pull boxes with the actual installed arrangement of connected conduits, calculated according to NFPA 70.
5. Coordinate the placement of boxes with millwork, furniture, devices, equipment, etc. installed under other sections or by others.
6. Coordinate the work with other trades to preserve insulation integrity.
7. Coordinate the work with other trades to provide walls suitable for installation of flush-mounted boxes where indicated.
8. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

**1.05 SUBMITTALS**

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for outlet and device boxes, junction and pull boxes, and floor boxes.

C. Project Record Documents: Record actual locations and mounting heights for outlet and device boxes, junction boxes, pull boxes, and floor boxes.

**PART 2 PRODUCTS**

**2.01 BOXES**

A. General Requirements:
1. Do not use boxes and associated accessories for applications other than as permitted by NFPA 70 and product listing.
2. Provide all boxes, fittings, supports, and accessories required for a complete raceway system and to accommodate devices and equipment to be installed.
3. Provide products listed, classified, and labeled as suitable for the purpose intended.
4. Where box size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
5. Provide grounding terminals within boxes where equipment grounding conductors terminate.

B. Outlet and Device Boxes Up to 100 cubic inches (1,650 cu cm), Including Those Used as Junction and Pull Boxes:
1. Use sheet-steel boxes for dry locations unless otherwise indicated or required.
2. Use cast iron boxes or cast aluminum boxes for damp or wet locations unless otherwise indicated or required; furnish with compatible weatherproof gasketed covers and threaded hubs.
3. Use suitable concrete type boxes where flush-mounted in concrete.
4. Use suitable masonry type boxes where flush-mounted in masonry walls.
5. Use raised covers suitable for the type of wall construction and device configuration where required.
6. Use shallow boxes where required by the type of wall construction.
7. Do not use "through-wall" boxes designed for access from both sides of wall.
8. Sheet-Steel Boxes: Comply with NEMA OS 1, and list and label as complying with UL 514A.
9. Cast Metal Boxes: Comply with NEMA FB 1, and list and label as complying with UL 514A; furnish with threaded hubs.

10. Boxes for Supporting Luminaires and Ceiling Fans: Listed as suitable for the type and weight of load to be supported; furnished with fixture stud to accommodate mounting of luminaire where required. Include 1/2 inch (13mm) male fixture studs where required.
11. Boxes for Ganged Devices: Use multigang boxes of single-piece construction. Do not use field-connected gangable boxes.
12. Wall Plates: Comply with Section 26 2726.
13. Junction and Pull Boxes
    a. Surface-mounted cast metal box: NEMA 250, Type 4; flat-flanged, surface-mounted junction box
        1) Material: Galvanized cast iron.
        2) Cover: Furnish with ground flange, neoprene gasket and stainless steel cover screws
    b. In-Ground cast metal box: NEMA 250, Type 6, inside flanged, recessed cover box for flush mounting.
        1) Material: Galvanized cast iron.
        2) Cover: Smooth cover with neoprene gasket and stainless steel cover screws.
        3) Cover Legend: ELECTRIC.
    c. Fiberglass handholes: Die-molded glass fiber hand holes.
        1) Cable Entrance: Pre-cut 6 inch x 6 inch cable entrance at center bottom of each side.
        2) Cover: Glass fiber weatherproof cover with non-skid finish.
14. Cabinets and Enclosures, Including Junction and Pull Boxes Larger Than 100 cubic inches (1,650 cu cm):
    a. Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E, or UL 508A.
    b. NEMA 250 Environment Type, Unless Otherwise Indicated:
        1) Indoor Clean, Dry Locations: Type 1, painted steel.
        2) Outdoor Locations: Type 3R, painted steel.
    c. Junction and Pull Boxes Larger Than 100 cubic inches (1,650 cu cm):
        1) Provide screw-cover or hinged-cover enclosures unless otherwise indicated.

C. Floor Boxes:
1. Description: Floor boxes compatible with floor box service fittings provided in accordance with Section 26 2726; with partitions to separate multiple services; furnished with all components, adapters, and trims required for complete installation. Shape shall be square.
2. Use cast iron floor boxes within slab on grade.
3. Metallic Floor Boxes: Fully adjustable (with integral means for leveling adjustment prior to and after concrete pour).
4. Manufacturer: Same as manufacturer of floor box service fittings.
5. Conform to regulatory requirements for concrete-tight floor boxes.
6. Covers:
    a. Single gang, Brass with duplex flip cover for duplex receptacles.
    b. Carpet flanges: Multi-gang, Brass.
7. Fittings:
    a. High-tension (15A-125 VAC), Brass.
    b. Low-tension (telephone / data), Brass.

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that mounting surfaces are ready to receive boxes.

C. Verify that conditions are satisfactory for installation prior to starting work.

## 3.02 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Install boxes in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130.

C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.

D. Use flush-mounting outlet boxes in all areas unless noted otherwise.

E. Use gang box with plaster ring for single device outlets.

F. Box Locations:
   1. Locate boxes to be accessible and to maintain headroom. Provide access panels in accordance with Section 08 3100 as required where approved by the Architect.
   2. Set wall mounted boxes at elevations to accommodate mounting heights indicated and specified.
   3. Unless dimensioned, box locations indicated are approximate. Adjust box location up to 10 feet if required to accommodate intended purpose.
   4. Locate boxes as required for devices installed under other sections or by others.
      a. Switches, Receptacles, and Other Wiring Devices: Comply with Section 26 2726.
      b. Communications Systems Outlets: Comply with Section 27 0741.
   5. Locate outlet boxes to allow luminaires positioned as shown on reflected ceiling plan.
   6. Coordinate mounting heights and locations of outlets mounted above counters, benches and backsplashes.
   7. Unless otherwise indicated, where multiple outlet boxes are installed at the same location at different mounting heights, install along a common vertical center line.
   8. Do not install flush-mounted boxes on opposite sides of walls back-to-back. Provide minimum 6 inches (150 mm) horizontal separation unless otherwise indicated.
   9. Acoustic-Rated Walls: Do not install flush-mounted boxes on opposite sides of walls back-to-back; provide minimum 24 inches (610 mm) horizontal separation.
   10. Fire Resistance Rated Walls: Install flush-mounted boxes such that the required fire resistance will not be reduced.
      a. Do not install flush-mounted boxes on opposite sides of walls back-to-back; provide minimum 24 inches (610 mm) separation where wall is constructed with individual noncommunicating stud cavities or protect both boxes with listed putty pads.
   11. Locate junction and pull boxes as indicated, as required to facilitate installation of conductors, and to limit conduit length and/or number of bends between pulling points in accordance with Section 26 0533.13.
   12. Locate junction and pull boxes in the following areas, unless otherwise indicated or approved by the Architect:
      a. Concealed above accessible suspended ceilings.
      b. Unfinished areas.

G. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness.

H. Inaccessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches (150 mm) from ceiling access panel or from removable recessed luminaire.

I. Box Supports:
   1. Secure and support boxes in accordance with NFPA 70 and Section 26 0529 using suitable supports and methods approved by the authority having jurisdiction.
   2. Provide independent support from building structure except for cast metal boxes (other than boxes used for fixture support) supported by threaded conduit connections in accordance with NFPA 70. Do not provide support from piping, ductwork, or other systems.
   3. Support boxes independently of conduit.

4. Installation Above Suspended Ceilings: Do not provide support from ceiling grid or ceiling support system.
5. Use stamped steel bridges to fasten flush mounting outlet box between studs.
6. Use adjustable steel channel fasteners for hung ceiling outlet box.

J. Install boxes plumb and level.

K. Flush-Mounted Boxes:
1. Install boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that front edge of box or associated raised cover is not set back from finished surface more than 1/4 inch (6 mm) or does not project beyond finished surface.
2. Install boxes in combustible materials such as wood so that front edge of box or associated raised cover is flush with finished surface.
3. Repair rough openings around boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that there are no gaps or open spaces greater than 1/8 inch (3 mm) at the edge of the box.
4. Locate flush mounting box in masonry wall to require cutting masonry unit corner only. Coordinate masonry cutting to achieve neat opening.

L. Install boxes as required to preserve insulation integrity.

M. Metallic Floor Boxes: Install box level at the proper elevation to be flush with finished floor.

N. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.

O. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 8400.

P. Close unused box openings.

Q. Install blank wall plates on junction boxes and on outlet boxes with no devices or equipment installed or designated for future use.

R. Provide grounding and bonding in accordance with Section 26 0526.

S. Identify boxes in accordance with Section 26 0553.

T. Large Pull Boxes: Use hinged enclosure in interior dry locations and surface-mounted cast metal box enclosure in other locations.

U. Use cast outlet box in exterior locations (exposed to the weather) and wet locations.

V. Use cast floor boxes for installation in slab on grade; formed steel boxes are acceptable for other installations.

**3.03 CLEANING**

A. Clean interior of boxes to remove dirt, debris, plaster and other foreign material.

B. Clean exposed surfaces and restore finish.

**3.04 ADJUSTING**

A. Adjust floor box flush with finish flooring material.

B. Adjust flush-mounting outlets to make front flush with finished wlal material.

C. Install knockout closures in unused box openings.

**END OF SECTION**

## SECTION 26 0553

## IDENTIFICATION FOR ELECTRICAL SYSTEMS

### PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Electrical identification requirements.

B. Identification nameplates and labels.

C. Wire and cable markers.

D. Voltage markers.

E. Underground warning tape.

F. Floor marking tape.

G. Warning signs and labels.

### 1.02 RELATED REQUIREMENTS

A. Section 09 9000 - Painting and Coating

B. Section 26 0519 - Low-Voltage Electrical Power Conductors and Cables: Color coding for power conductors and cables 600 V and less; vinyl color coding electrical tape.

### 1.03 REFERENCE STANDARDS

A. ANSI Z535.2 - American National Standard for Environmental and Facility Safety Signs; 2011.

B. ANSI Z535.4 - American National Standard for Product Safety Signs and Labels; 2011.

C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

D. UL 969 - Marking and Labeling Systems; Current Edition, Including All Revisions.

### 1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Verify final designations for equipment, systems, and components to be identified prior to fabrication of identification products.

B. Sequencing:
   1. Do not conceal items to be identified, in locations such as above suspended ceilings, until identification products have been installed.
   2. Do not install identification products until final surface finishes and painting are complete.

### 1.05 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

### 1.06 FIELD CONDITIONS

A. Do not install adhesive products when ambient temperature is lower than recommended by manufacturer.

### PART 2 PRODUCTS

### 2.01 IDENTIFICATION REQUIREMENTS

A. Identification for Equipment:
   1. Use identification nameplate to identify each piece of electrical distribution and control equipment and associated sections, compartments, and components.
      a. Switchgear:
         1) Identify ampere rating.
         2) Identify voltage and phase.
         3) Identify power source and circuit number. Include location when not within sight of equipment.
      b. Panelboards:

1) Identify ampere rating.
2) Identify voltage and phase.
3) Identify power source and circuit number. Include location when not within sight of equipment.
4) Use typewritten circuit directory to identify load(s) served for panelboards with a door. Identify spares and spaces using pencil.

c. Transformers:
1) Identify kVA rating.
2) Identify voltage and phase for primary and secondary.
3) Identify power source and circuit number. Include location when not within sight of equipment.

d. Enclosed switches, circuit breakers, and motor controllers:
1) Identify voltage and phase.
2) Identify power source and circuit number. Include location when not within sight of equipment.

e. Enclosed Contactors:
1) Identify ampere rating.
2) Identify load(s) and associated circuits controlled. Include location.

2. Service Equipment:
a. Use identification nameplate to identify each service disconnecting means.

3. Use field-painted floor markings, floor marking tape, or warning labels to identify required equipment working clearances where indicated or where required by the authority having jurisdiction.
a. Field-Painted Floor Markings: Alternating black and white stripes, 3 inches (76 mm) wide, painted in accordance with Section 09 9000.

4. Available Fault Current Documentation: Use identification label to identify the available fault current and date calculations were performed at locations requiring documentation by NFPA 70, including but not limited to the following.
a. Service equipment.

B. Identification for Conductors and Cables:
1. Color Coding for Power Conductors 600 V and Less: Comply with Section 26 0519.
2. Identification for Communications Conductors and Cables: Comply with Division 27.
3. Use identification nameplate or identification label to identify color code for ungrounded and grounded power conductors inside door or enclosure at each piece of feeder or branch-circuit distribution equipment when premises has feeders or branch circuits served by more than one nominal voltage system.
4. Use wire and cable markers to identify circuit number or other designation indicated for power, control, and instrumentation conductors and cables at the following locations:
a. At each source and load connection.
b. Within boxes when more than one circuit is present.
5. Use wire and cable markers to identify connected grounding electrode system components for grounding electrode conductors.

C. Identification for Raceways:
1. Use voltage markers to identify highest voltage present for accessible conduits at maximum intervals of 20 feet (6.1 m) or use painted fittings.
2. Use voltage markers or color-coded bands to identify systems other than normal power system for accessible conduits at maximum intervals of 20 feet (6.1 m).
a. Color-Coded Bands: Use field-painting or vinyl color coding electrical tape to mark bands 3 inches (76 mm) wide.
1) Color Code:
(a) 480 Volt System: Brown.
(b) 208 Volt System: Blue.
(c) Fire Alarm System: Red.
(d) Telephone System: Gray.

2) Field-Painting: Comply with Section 09 9000.
3) Vinyl Color Coding Electrical Tape: Comply with Section 26 0519.

3. Use identification labels, handwritten text using indelible marker, or plastic marker tags to identify spare conduits at each end. Identify purpose and termination location.
4. Use underground warning tape to identify underground raceways.

D. Identification for Boxes:
1. Use voltage markers or color coded boxes to identify systems other than normal power system.
a. Color-Coded Boxes: Field-painted in accordance with per the same color code used for raceways.

E. Identification for Devices:
1. Identification for Communications Devices: Comply with Section 27 1005.
2. Use identification label to identify fire alarm system devices.
3. Use identification label or engraved wallplate to identify serving branch circuit for all receptacles.

**2.02 IDENTIFICATION NAMEPLATES AND LABELS**

A. Identification Nameplates:
1. Materials:
a. Indoor Clean, Dry Locations: Use plastic nameplates.
b. Outdoor Locations: Use plastic, stainless steel, or aluminum nameplates suitable for exterior use.
2. Plastic Nameplates: Three-layer laminated acrylic or electrically non-conductive phenolic with beveled edges; minimum thickness of 1/16 inch (1.6 mm); engraved text.
3. Stainless Steel Nameplates: Minimum thickness of 1/32 inch (0.8 mm); engraved or laser-etched text.
4. Aluminum Nameplates: Anodized; minimum thickness of 1/32 inch (0.8 mm); engraved or laser-etched text.
5. Secure nameplate to equipment front using screws, rivets or permanent adhesive.

B. Identification Labels:
1. Materials: Use self-adhesive laminated plastic labels; UV, chemical, water, heat, and abrasion resistant.
a. Use only for indoor locations.
2. Text: Use factory pre-printed or machine-printed text. Do not use handwritten text unless otherwise indicated.

C. Format for Equipment Identification:
1. Minimum Size: 1 inch (25 mm) by 2.5 inches (64 mm).
2. Legend:
a. Equipment designation or other approved description.
3. Text: All capitalized unless otherwise indicated.
4. Minimum Text Height:
a. Equipment Designation:
1) 1/8 inch (3 mm) for identifying individual equipment and loads.
2) 1/4 inch (6 mm) for identifying grouped equipment and loads.
b. Other Information: 1/4 inch (6 mm).
5. Color:
a. Normal Power System: White text on black background.
b. Fire Alarm System: White text on red background.

D. Format for Receptacle Identification:
1. Minimum Size: 3/8 inch (10 mm) by 1.5 inches (38 mm).
2. Legend: Power source and circuit number or other designation indicated.
a. Include voltage and phase for other than 120 V, single phase circuits.
3. Text: All capitalized unless otherwise indicated.

4. Minimum Text Height: 3/16 inch (5 mm).
5. Color: Black text on clear background.

E. Format for Fire Alarm Device Identification:
1. Minimum Size: 3/8 inch (10 mm) by 1.5 inches (38 mm).
2. Legend: Designation indicated and device zone or address.
3. Text: All capitalized unless otherwise indicated.
4. Minimum Text Height: 3/16 inch (5 mm).
5. Color: Red text on white background.

**2.03 WIRE AND CABLE MARKERS**

A. Manufacturers:
1. Brady Corporation: www.bradyid.com.
2. HellermannTyton: www.hellermanntyton.com.
3. Panduit Corp: www.panduit.com.

B. Markers for Conductors and Cables: Use wrap-around self-adhesive vinyl cloth, wrap-around self-adhesive vinyl self-laminating, heat-shrink sleeve, plastic sleeve, plastic clip-on, or vinyl split sleeve type markers suitable for the conductor or cable to be identified.

C. Markers for Conductor and Cable Bundles: Use plastic marker tags secured by nylon cable ties.

D. Legend: Power source and circuit number or other designation indicated.

E. Text: Use factory pre-printed or machine-printed text, all capitalized unless otherwise indicated.
1. Do not use handwritten text.

F. Minimum Text Height: 1/8 inch (3 mm).

G. Color: Black text on white background unless otherwise indicated.

**2.04 VOLTAGE MARKERS**

A. Markers for Conduits: Use factory pre-printed self-adhesive vinyl, self-adhesive vinyl cloth, or vinyl snap-around type markers.

B. Markers for Boxes and Equipment Enclosures: Use factory pre-printed self-adhesive vinyl or self-adhesive vinyl cloth type markers.

C. Minimum Size:
1. Markers for Conduits: As recommended by manufacturer for conduit size to be identified.
2. Markers for Pull Boxes: 1 1/8 by 4 1/2 inches (29 by 110 mm).
3. Markers for Junction Boxes: 1/2 by 2 1/4 inches (13 by 57 mm).

D. Legend:
1. Markers for Voltage Identification: Highest voltage present.

E. Color: Black text on clear background unless otherwise indicated.

**2.05 UNDERGROUND WARNING TAPE**

A. Manufacturers:
1. Brady Corporation: www.bradyid.com.
2. Brimar Industries, Inc: www.brimar.com.
3. Seton Identification Products: www.seton.com.

B. Materials: Use non-detectable type polyethylene tape suitable for direct burial, unless otherwise indicated.
1. Exception: Use foil-backed detectable type tape where required by serving utility or where directed by Owner.

C. Non-detectable Type Tape: 6 inches (152 mm) wide, with minimum thickness of 4 mil (0.1 mm).

D. Foil-backed Detectable Type Tape: 3 inches (76 mm) wide, with minimum thickness of 5 mil (0.1 mm), unless otherwise required for proper detection.

E. Legend: Type of service, continuously repeated over full length of tape.

F. Color:
   1. Tape for Buried Power Lines: Black text on red background.
   2. Tape for Buried Communication, Alarm, and Signal Lines: Black text on orange background.

**2.06 FLOOR MARKING TAPE**

A. Manufacturers:
   1. Brady Corporation: www.bradyid.com.
   2. Brimar Industries, Inc: www.brimar.com.
   3. Seton Identification Products: www.seton.com.

B. Floor Marking Tape for Equipment Working Clearance Identification: Self-adhesive vinyl or polyester tape with overlaminate, 3 inches (76 mm) wide, with alternating black and white stripes.

**2.07 WARNING SIGNS AND LABELS**

A. Comply with ANSI Z535.2 or ANSI Z535.4 as applicable.

B. Warning Signs:
   1. Materials:
      a. Indoor Dry, Clean Locations: Use factory pre-printed rigid plastic or self-adhesive vinyl signs.
      b. Outdoor Locations: Use factory pre-printed rigid aluminum signs.
   2. Rigid Signs: Provide four mounting holes at corners for mechanical fasteners.
   3. Minimum Size: 7 by 10 inches (178 by 254 mm) unless otherwise indicated.

C. Warning Labels:
   1. Materials: Use factory pre-printed or machine-printed self-adhesive polyester or self-adhesive vinyl labels; UV, chemical, water, heat, and abrasion resistant; produced using materials recognized to UL 969.
   2. Machine-Printed Labels: Use thermal transfer process printing machines and accessories recommended by label manufacturer.
   3. Minimum Size: 2 by 4 inches (51 mm by 102 mm) unless otherwise indicated.

**PART 3 EXECUTION**

**3.01 PREPARATION**

A. Clean surfaces to receive adhesive products according to manufacturer's instructions.

**3.02 INSTALLATION**

A. Install products in accordance with manufacturer's instructions.

B. Install identification products to be plainly visible for examination, adjustment, servicing, and maintenance. Unless otherwise indicated, locate products as follows:
   1. Surface-Mounted Equipment: Enclosure front.
   2. Flush-Mounted Equipment: Inside of equipment door.
   3. Free-Standing Equipment: Enclosure front; also enclosure rear for equipment with rear access.
   4. Elevated Equipment: Legible from the floor or working platform.
   5. Interior Components: Legible from the point of access.
   6. Conductors and Cables: Legible from the point of access.
   7. Devices: Outside face of cover.

C. Install identification products centered, level, and parallel with lines of item being identified.

D. Secure nameplates to exterior surfaces of enclosures using stainless steel screws and to interior surfaces using self-adhesive backing or epoxy cement.

E. Install self-adhesive labels and markers to achieve maximum adhesion, with no bubbles or wrinkles and edges properly sealed.

F. Install underground warning tape above buried lines with one tape per trench at 3 inches (75 mm) below finished grade.

**END OF SECTION**

# SECTION 26 0583
# WIRING CONNECTIONS

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Electrical connections to equipment specified under other sections.

### 1.02 RELATED REQUIREMENTS

A. Section 26 0519 - Low-Voltage Electrical Power Conductors and Cables.

B. Section 26 0533.13 - Conduit for Electrical Systems.

C. Section 26 0533.16 - Boxes for Electrical Systems.

D. Section 26 2726 - Wiring Devices.

E. Section 26 2816.16 - Enclosed Switches.

### 1.03 REFERENCE STANDARDS

A. NEMA WD 1 - General Color Requirements for Wiring Devices; 1999 (R2015).

B. NEMA WD 6 - Wiring Devices - Dimensional Specifications; 2016.

C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

### 1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Obtain and review shop drawings, product data, manufacturer's wiring diagrams, and manufacturer's instructions for equipment furnished under other sections. Electrical Contractor is responsible for furnishing and installed all components, material, conduit, wiring, etc. that is not being provided under other sections but is required for proper system operation.
   2. Determine connection locations and requirements.
   3. Control wiring at 120 volts or heigher shall be furnished and installed by Electrical Contractor.

B. Sequencing:
   1. Install rough-in of electrical connections before installation of equipment is required.
   2. Make electrical connections before required start-up of equipment.

### 1.05 SUBMITTALS

## PART 2 PRODUCTS

### 2.01 MATERIALS

A. Cords and Caps: NEMA WD 6; match receptacle configuration at outlet provided for equipment.
   1. Colors: Conform to NEMA WD 1.
   2. Cord Construction: NFPA 70, Type SO, multiconductor flexible cord with identified equipment grounding conductor, suitable for use in damp locations.
   3. Size: Suitable for connected load of equipment, length of cord, and rating of branch circuit overcurrent protection.

B. Disconnect Switches: As specified in Section 26 2816.16 and in individual equipment sections.

C. Wiring Devices: As specified in Section 26 2726.

D. Flexible Conduit: As specified in Section 26 0533.13.

E. Wire and Cable: As specified in Section 26 0519.

F. Boxes: As specified in Section 26 0533.16.

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verify that equipment is ready for electrical connection, wiring, and energization.

B. Verify conditions under provisions of other sections.

### 3.02 ELECTRICAL CONNECTIONS

A. Make electrical connections in accordance with equipment manufacturer's instructions.

B. Make conduit connections to equipment using flexible conduit. Use liquidtight flexible conduit with watertight connectors in damp or wet locations.

C. Connect heat producing equipment using wire and cable with insulation suitable for temperatures encountered.

D. Provide receptacle outlet to accommodate connection with attachment plug.

E. Provide cord and cap where field-supplied attachment plug is required.

F. Install suitable strain-relief clamps and fittings for cord connections at outlet boxes and equipment connection boxes.

G. Install disconnect switches, controllers, control stations, and control devices to complete equipment wiring requirements. These devices shall not be mounted to equipment, only to adjacent structural elements.

H. Install terminal block jumpers to complete equipment wiring requirements.

I. Install interconnecting conduit and wiring between devices and equipment to complete equipment wiring requirements.

**END OF SECTION**

**SECTION 26 0923**

**LIGHTING CONTROL DEVICES**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Occupancy sensors.

B. Time switches.

C. Outdoor photo controls.

D. Daylighting controls (if applicable).

E. Lighting contactors.

### 1.02 RELATED REQUIREMENTS

A. Section 26 0529 - Hangers and Supports for Electrical Systems.

B. Section 26 0533.16 - Boxes for Electrical Systems.

### 1.03 REFERENCE STANDARDS

A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.

B. NECA 130 - Standard for Installing and Maintaining Wiring Devices; 2010.

C. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2014.

D. NEMA 410 - Performance Testing for Lighting Controls and Switching Devices with Electronic Drivers and Discharge Ballasts; 2015.

E. NEMA ICS 2 - Industrial Control and Systems Controllers, Contactors and Overload Relays Rated 600 Volts; 2000 (R2005), with errata, 2008.

F. NEMA ICS 6 - Industrial Control and Systems: Enclosures; 1993 (R2011).

G. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

H. UL 773A - Nonindustrial Photoelectric Switches for Lighting Control; Current Edition, Including All Revisions.

I. UL 917 - Clock-Operated Switches; Current Edition, Including All Revisions.

J. UL 60947-1 - Low-Voltage Switchgear and Controlgear - Part 1: General Rules; Current Edition, Including All Revisions.

K. UL 60947-4-1 - Low-Voltage Switchgear and Controlgear - Part 4-1: Contactors and Motor-starters - Electromechanical Contactors and Motor-starters; Current Edition, Including All Revisions.

### 1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate the placement of lighting control devices with millwork, furniture, equipment, etc. installed under other sections or by others.
2. Coordinate the placement of occupancy sensors with millwork, furniture, equipment or other potential obstructions to motion detection coverage installed under other sections or by others.
3. Coordinate the placement of photo sensors for daylighting controls with windows, skylights, and luminaires to achieve optimum operation. Coordinate placement with ductwork, piping, equipment, or other potential obstructions to light level measurement installed under other sections or by others.
4. Notify Architect of any conflicts or deviations from the contract documents to obtain direction prior to proceeding with work.

B. Sequencing:

1. Do not install lighting control devices until final surface finishes and painting are complete.

## 1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Include ratings, configurations, standard wiring diagrams, dimensions, colors, service condition requirements, and installed features.
   1. Occupancy Sensors: Include detailed motion detection coverage range diagrams.

C. Shop Drawings:
   1. Indicate outline and support point dimensions, specifications and listings. Indicate operation and programming information. Provide manufacturers and ratings.

D. Manufacturer's Installation Instructions: Include application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

E. Operation and Maintenance Data: Include detailed information on device programming and setup.

F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. Spare parts listing and recommended maintenance procedures and intervals.

G. Project Record Documents: Record actual installed locations and settings for lighting control devices.

## 1.06 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

C. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

# PART 2 PRODUCTS

## 2.01 LIGHTING CONTROL DEVICES - GENERAL REQUIREMENTS

A. Provide products listed, classified, and labeled as suitable for the purpose intended.

B. Unless specifically indicated to be excluded, provide all required conduit, wiring, connectors, hardware, components, accessories, etc. as required for a complete operating system.

C. Products for Switching of Electronic Ballasts/Drivers: Tested and rated to be suitable for peak inrush currents specified in NEMA 410.

## 2.02 OCCUPANCY SENSORS

A. Manufacturers:
   1. Vendor #18

B. All Occupancy Sensors:
   1. Description: Factory-assembled commercial specification grade devices for indoor use capable of sensing both major motion, such as walking, and minor motion, such as small desktop level movements, according to published coverage areas, for automatic control of load indicated.
   2. Sensor Technology:
      a. Passive Infrared (PIR) Occupancy Sensors: Designed to detect occupancy by sensing movement of thermal energy between zones.
      b. Ultrasonic Occupancy Sensors: Designed to detect occupancy by sensing frequency shifts in emitted and reflected inaudible sound waves.
      c. Passive Infrared/Ultrasonic Dual Technology Occupancy Sensors: Designed to detect occupancy using a combination of both passive infrared and ultrasonic technologies.
   3. Provide LED to visually indicate motion detection with separate color LEDs for each sensor type in dual technology units.

4. Operation: Unless otherwise indicated, occupancy sensor to turn load on when occupant presence is detected and to turn load off when no occupant presence is detected during an adjustable turn-off delay time interval.
5. Turn-Off Delay: Field adjustable, with time delay settings up to 30 minutes.
6. Load Rating for Line Voltage Occupancy Sensors: As required to control the load indicated on the drawings.

**2.03 TIME SWITCHES**

A. Manufacturers:
1. Tork, a division of NSI Industries LLC; www.tork.com.
2. Paragon; www.paragoncontrol.com.
3. Intermatic, Inc; www.intermatic.com.

B. Electromechanical Time Switches:
1. Description: Factory-assembled controller with motor-operated timing dial mechanism and adjustable trippers for setting on/off operations, listed and labeled as complying with UL 917.
2. Program Capability:
a. 7-Day Time Switches: Capable of different schedule for each day of the week.
b. Astronomic Time Switches: With same schedule for each day of the week and skip-a-day feature to omit selected days with automatic adjustment for seasonal changes in sunrise and sunset times.
3. Schedule Capacity:
a. 7-Day Time Switches: Accommodating not less than two pairs of selected on/off operations per day.
b. Astronomic Time Switches: Capable of turning load on at sunset and off at either sunrise or selected fixed time.
4. Provide 12-hour spring reserve backup to maintain clock during power outage.
5. Manual override: Capable of overriding current schedule both permanently and temporarily until next scheduled event.
6. Input Supply Voltage: As indicated on the drawings.
7. Output Switch Configuration: 3 PST.
8. Output Switch Contact Ratings: 40 amperes.
9. Provide lockable enclosure; environmental type per NEMA 250 as specified for the following installation locations:
a. Indoor clean, dry locations: Type 1.

**2.04 OUTDOOR PHOTO CONTROLS**

A. Manufacturers:
1. Intermatic, Inc: www.intermatic.com.
2. Paragon; www.paragoncontrol.com.
3. Tork, a division of NSI Industries LLC: www.tork.com.

B. Stem-Mounted Outdoor Photo Controls:
1. Description: Direct-wired photo control unit with threaded conduit mounting stem and field-adjustable swivel base, listed and labeled as complying with UL 773A.
2. Housing: Weatherproof, heavy duty die cast metal.
3. Photo Sensor: Cadmium sulfide.
4. Provide external sliding shield for field adjustment of light level activation.
5. Light Level Activation: 1 to 5 footcandles (10.8 to 53.8 lux) turn-on and 3 to 1 turn-off to turn-on ratio with 2 minuted delayed turn-off.
6. Voltage: As required to control the load indicated on the drawings.
7. Failure Mode: Fails to the on position.
8. Load Rating: 2000 watt contact rating.

**2.05 DAYLIGHTING CONTROLS**

A. Manufacturers:

1. Vendor #18

B. System Description: Control system consisting of photo sensors and compatible control modules and power packs, contactors, or relays as required for automatic control of load indicated according to available natural light; capable of integrating with occupancy sensors and manual override controls.

C. Dimming Photo Sensors: Photo sensor units with integral controller compatible with specified dimming ballasts, for direct continuous dimming of up to 50 ballasts.

## 2.06 LIGHTING CONTACTORS

A. Manufacturers:
1. Schneider Electric; Square D Products: www.schneider-electric.us
2. General Electric Company: www.geindustrial.com.
3. Asco: www.ascopower.cpm.

B. Description: Magnetic lighting contactors complying with NEMA ICS 2, and listed and labeled as complying with UL 60947-1 and UL 60947-4-1; noncombination type unless otherwise indicated; ratings, configurations and features as indicated on the drawings.
1. Configuration: Mechanically held, 2 wire control for photoelectric or time clock, 3 wire control for switches.

C. Coil Voltage: As indicated or to match circuit controlled.

D. Contact Rating: 20 ampere minimum or as indicated. Match branch circuit overcurrent protection, considering derating for continuous loads.

E. Short Circuit Current Rating:
1. Provide contactors with listed short circuit current rating not less than the available fault current at the installed location as indicated on the drawings.

F. Enclosures:
1. Comply with NEMA ICS 6.
2. Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:
a. Indoor Clean, Dry Locations: Type 1 or Type 12.
3. Finish: Manufacturer's standard unless otherwise indicated.

# PART 3 EXECUTION

## 3.01 EXAMINATION

A. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate devices and conductors in accordance with NFPA 70.

B. Verify that openings for outlet boxes are neatly cut and will be completely covered by devices or wall plates.

C. Verify that final surface finishes are complete, including painting.

D. Verify that branch circuit wiring installation is completed, tested, and ready for connection to lighting control devices.

E. Verify that the service voltage and ratings of lighting control devices are appropriate for the service voltage and load requirements at the location to be installed.

F. Verify that conditions are satisfactory for installation prior to starting work.

## 3.02 PREPARATION

A. Provide extension rings to bring outlet boxes flush with finished surface.

B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

## 3.03 INSTALLATION

A. Install lighting control devices in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards unless otherwise indicated.

B. Coordinate locations of outlet boxes provided under Section 26 0533.16 as required for installation of lighting control devices provided under this section.

C. Install lighting control devices in accordance with manufacturer's instructions.

D. Unless otherwise indicated, connect lighting control device grounding terminal or conductor to branch circuit equipment grounding conductor and to outlet box with bonding jumper.

E. Install lighting control devices plumb and level, and held securely in place.

F. Provide required supports in accordance with Section 26 0529.

G. Outdoor Photo Control Locations:
   1. Where possible, locate outdoor photo controls with photo sensor facing north. If north facing photo sensor is not possible, install with photo sensor facing east, west, or down.
   2. Locate outdoor photo controls so that photo sensors do not face artificial light sources, including light sources controlled by the photo control itself.

H. Install outdoor photo controls so that connections are weatherproof. Do not install photo controls with conduit stem facing up in order to prevent infiltration of water into the photo control.

I. Daylighting Control Photo Sensor Locations:
   1. Located photocell as required by local authority having jurisdiction.

J. Unless otherwise indicated, install power packs for lighting control devices above accessible ceiling or above access panel in inaccessible ceiling near the sensor location.

**3.04 FIELD QUALITY CONTROL**

A. See Section 01 4000 - Quality Requirements, for additional requirements.

B. Inspect each lighting control device for damage and defects.

C. Test occupancy sensors to verify proper operation, including time delays and ambient light thresholds where applicable. Verify optimal coverage for entire room or area.

D. Test time switches to verify proper operation.

E. Test outdoor photo controls to verify proper operation, including time delays where applicable.

F. Test daylighting controls to verify proper operation, including light level measurements and time delays where applicable. Record test results in written report to be included with submittals.

G. Correct wiring deficiencies and replace damaged or defective lighting control devices.

**3.05 ADJUSTING**

A. Adjust devices and wall plates to be flush and level.

B. Adjust occupancy sensor settings to minimize undesired activations while optimizing energy savings, and to achieve desired function as indicated or as directed by Architect.

C. Adjust time switch settings to achieve desired operation schedule as indicated or as directed by Architect.

D. Adjust daylighting controls under optimum lighting conditions after all room finishes, furniture, and window treatments have been installed to achieve desired operation as indicated or as directed by Architect. Record settings in written report to be included with submittals. Readjust controls calibrated prior to installation of final room finishes, furniture, and window treatments that do not function properly as determined by Architect.

**3.06 CLEANING**

A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

**3.07 CLOSEOUT ACTIVITIES**

A. See Section 01 7000 - Execution and Closeout Requirements, for closeout submittals.

B. Training: Train Owner's personnel on operation, adjustment, programming, and maintenance of lighting control devices.

1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.

**END OF SECTION**

# SECTION 26 2416
# PANELBOARDS

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Power distribution panelboards.

B. Branch circuit panelboards.

C. Overcurrent protective devices for panelboards.

### 1.02 RELATED REQUIREMENTS

A. Section 26 0526 - Grounding and Bonding for Electrical Systems.

B. Section 26 0529 - Hangers and Supports for Electrical Systems.

C. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.

D. Section 26 2813 - Fuses: Fuses for fusible switches and spare fuse cabinets.

### 1.03 REFERENCE STANDARDS

A. FS W-C-375 - Circuit Breakers, Molded Case; Branch Circuit and Service; Revision E with Supplement 1, 2013.

B. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.

C. NECA 407 - Standard for Installing and Maintaining Panelboards; 2015.

D. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2014.

E. NEMA PB 1 - Panelboards; 2011.

F. NEMA PB 1.1 - General Instructions for Proper Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less; 2013.

G. NETA ATS - Acceptance Testing Specifications for Electrical Power Equipment and Systems; 2013.

H. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

I. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations; Current Edition, Including All Revisions.

J. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations; Current Edition, Including All Revisions.

K. UL 67 - Panelboards; Current Edition, Including All Revisions.

L. UL 489 - Molded-Case Circuit Breakers, Molded-Case Switches and Circuit Breaker Enclosures; Current Edition, Including All Revisions.

M. UL 869A - Reference Standard for Service Equipment; Current Edition, Including All Revisions.

N. UL 943 - Ground-Fault Circuit-Interrupters; Current Edition, Including All Revisions.

O. UL 1053 - Ground-Fault Sensing and Relaying Equipment; Current Edition, Including All Revisions.

### 1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances for electrical equipment required by NFPA 70.
2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.

3. Verify with manufacturer that conductor terminations are suitable for use with the conductors to be installed.
4. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

**1.05 SUBMITTALS**

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate outline and support point dimensions, voltage, main bus ampacity, overcurrent protective device arrangement and sizes, short circuit current ratings, conduit entry locations, conductor terminal information, and installed features and accessories.

C. Source Quality Control Test Reports: Include reports for tests designated in NEMA PB 1 as routine tests.

D. Field Quality Control Test Reports.

E. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

F. Project Record Documents: Record actual installed locations of panelboards and actual installed circuiting arrangements.

G. Maintenance Data: Include information on replacement parts and recommended maintenance procedures and intervals.

H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
1. Panelboard Keys: Four of each different key.
2. See Section 26 2813 for requirements for spare fuses and spare fuse cabinets.

**1.06 QUALITY ASSURANCE**

A. Conform to requirements of NFPA 70.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

C. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

**1.07 DELIVERY, STORAGE, AND HANDLING**

A. Receive, inspect, handle, and store panelboards in accordance with manufacturer's instructions and NECA 407.

B. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.

C. Handle carefully in accordance with manufacturer's written instructions to avoid damage to panelboard internal components, enclosure, and finish.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

A. Schneider Electric; Square D Products: www.schneider-electric.us.

B. General Electric Company: www.geindustrial.com.

C. Siemens Industry, Inc: www.usa.siemens.com.

D. Eaton Corporation: www.eaton.com.

E. Source Limitations: Furnish panelboards and associated components produced by the same manufacturer as the other electrical distribution equipment used for this project and obtained from a single supplier.

**2.02 PANELBOARDS - GENERAL REQUIREMENTS**

A. Provide products listed, classified, and labeled as suitable for the purpose intended.

B. Unless otherwise indicated, provide products suitable for continuous operation under the following service conditions:
   1. Altitude: Less than 6,600 feet (2,000 m).
   2. Ambient Temperature:
      a. Panelboards Containing Circuit Breakers: Between 23 degrees F (-5 degrees C) and 104 degrees F (40 degrees C).

C. Short Circuit Current Rating:
   1. Provide panelboards with listed short circuit current rating not less than the available fault current at the installed location as indicated on the drawings.
   2. Label equipment utilizing series ratings as required by NFPA 70.

D. Panelboards Used for Service Entrance: Listed and labeled as suitable for use as service equipment according to UL 869A.

E. Mains: Configure for top or bottom incoming feed as indicated or as required for the installation.

F. Branch Overcurrent Protective Devices: Replaceable without disturbing adjacent devices.

G. Bussing: Sized in accordance with UL 67 temperature rise requirements.
   1. Provide fully rated neutral bus unless otherwise indicated, with a suitable lug for each feeder or branch circuit requiring a neutral connection.
   2. Provide solidly bonded equipment ground bus in each panelboard, with a suitable lug for each feeder and branch circuit equipment grounding conductor.
   3. Provide separate isolated/insulated ground bus where indicated or where isolated grounding conductors are provided.

H. Conductor Terminations: Suitable for use with the conductors to be installed.

I. Enclosures: Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E.
   1. Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:
      a. Indoor Clean, Dry Locations: Type 1.
      b. Outdoor Locations: Type 3R.
   2. Boxes: Galvanized steel unless otherwise indicated.
      a. Provide wiring gutters sized to accommodate the conductors to be installed.
      b. Increase gutter space as required where sub-feed lugs, feed-through lugs, gutter taps, or oversized lugs are provided.
      c. Provide removable end walls for NEMA Type 1 enclosures.
      d. Provide painted steel boxes for surface-mounted panelboards where indicated, finish to match fronts.
   3. Fronts:
      a. Fronts for Surface-Mounted Enclosures: Same dimensions as boxes.
      b. Finish for Painted Steel Fronts: Manufacturer's standard grey unless otherwise indicated.
   4. Lockable Doors: All locks keyed alike unless otherwise indicated.

J. Future Provisions: Prepare all unused spaces for future installation of devices including bussing, connectors, mounting hardware and all other required provisions.

K. Ground Fault Protection: Where ground-fault protection is indicated, provide system listed and labeled as complying with UL 1053.
   1. Where electronic circuit breakers equipped with integral ground fault protection are used, provide separate neutral current sensor where applicable.

L. Multi-Section Panelboards: Provide enclosures of the same height, with feed-through lugs or sub-feed lugs and feeders as indicated or as required to interconnect sections.

## 2.03 POWER DISTRIBUTION PANELBOARDS

A. Description: Panelboards complying with NEMA PB 1, power and feeder distribution type, circuit breaker type, and listed and labeled as complying with UL 67; ratings, configurations and features as indicated on the drawings.

B. Bussing:
   1. Phase and Neutral Bus Material: Copper.
   2. Ground Bus Material: Copper.

C. Circuit Breakers:
   1. Provided with integral thermal and instantaneous magnetic trip in each pole. Provide circuit breakers UL listed as Type HACR for air conditioning equipment branch circuits.
   2. Provide trip units and auxiliary switches as indicated.

D. Enclosures:
   1. Provide surface-mounted enclosures unless otherwise indicated.
   2. Fronts: Provide lockable hinged door with concealed hinges for access to overcurrent protective device handles without exposing live parts.
   3. Provide clear plastic circuit directory holder mounted on inside of door.

## 2.04 BRANCH CIRCUIT PANELBOARDS

A. Description: Panelboards complying with NEMA PB 1, lighting and appliance branch circuit type, circuit breaker type, and listed and labeled as complying with UL 67; ratings, configurations and features as indicated on the drawings.

B. Bussing:
   1. Phase Bus Connections: Arranged for sequential phasing of overcurrent protective devices.
   2. Phase and Neutral Bus Material: Copper.
   3. Ground Bus Material: Copper.

C. Circuit Breakers: Thermal magnetic bolt-on type unless otherwise indicated, with common trip handle for all poles, listed as SWD for lighting circuits, type HACR for air conditioning equipment circuits, Class A ground fault interrupter circuit breakers where scheduled. Do not use tandem circuit breakers. Visual trip indicators are required.

D. Enclosures:
   1. Provide surface-mounted or flush-mounted enclosures as indicated.
   2. Fronts: Provide lockable hinged door with concealed hinges for access to overcurrent protective device handles without exposing live parts.
   3. Provide clear plastic circuit directory holder mounted on inside of door.

E. Provide lock-on devices for installation of circuits required by local authorities.

## 2.05 OVERCURRENT PROTECTIVE DEVICES

A. Molded Case Circuit Breakers:
   1. Description: Quick-make, quick-break, over center toggle, trip-free, trip-indicating circuit breakers listed and labeled as complying with UL 489, and complying with FS W-C-375 where applicable; ratings, configurations, and features as indicated on the drawings.
   2. Interrupting Capacity:
      a. Provide circuit breakers with interrupting capacity as required to provide the short circuit current rating indicated, but not less than:
      b. Fully Rated Systems: Provide circuit breakers with interrupting capacity not less than the short circuit current rating indicated.
      c. Series Rated Systems: Provide circuit breakers listed in combination with upstream devices to provide interrupting rating not less than the short circuit current rating indicated.
   3. Conductor Terminations:
      a. Provide mechanical lugs unless otherwise indicated.
      b. Lug Material: Aluminum, suitable for terminating aluminum or copper conductors.

4. Thermal Magnetic Circuit Breakers: For each pole, furnish thermal inverse time tripping element for overload protection and magnetic instantaneous tripping element for short circuit protection.
5. Electronic Trip Circuit Breakers: Furnish solid state, microprocessor-based, true rms sensing trip units.
6. Multi-Pole Circuit Breakers: Furnish with common trip for all poles.
7. Provide the following circuit breaker types where indicated:
    a. Ground Fault Circuit Interrupter (GFCI) Circuit Breakers: Listed as complying with UL 943, class A for protection of personnel.
8. Do not use tandem circuit breakers.
9. Do not use handle ties in lieu of multi-pole circuit breakers.
10. Provide the following features and accessories where indicated or where required to complete installation:
    a. Handle Pad-Lock Provision: For locking circuit breaker handle in OFF position.

**2.06 SOURCE QUALITY CONTROL**

A. Factory test panelboards according to NEMA PB 1.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

A. Verify that the ratings and configurations of the panelboards and associated components are consistent with the indicated requirements.

B. Verify that mounting surfaces are ready to receive panelboards.

C. Verify that conditions are satisfactory for installation prior to starting work.

**3.02 INSTALLATION**

A. Perform work in accordance with NECA 1 (general workmanship).

B. Install products in accordance with manufacturer's instructions.

C. Install panelboards in accordance with NECA 407 and NEMA PB 1.1.

D. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.

E. Provide required supports in accordance with Section 26 0529.

F. Install panelboards plumb.

G. Install flush-mounted panelboards so that trims fit completely flush to wall with no gaps and rough opening completely covered.

H. Mount panelboards such that the highest position of any operating handle for circuit breakers or switches does not exceed 79 inches (2000 mm) above the floor or working platform.

I. Provide minimum of five spare 1 inch (27 mm) trade size conduits out of each flush-mounted panelboard stubbed into accessible space above ceiling and below floor. Identify conduits as spare.

J. Provide grounding and bonding in accordance with Section 26 0526.
    1. Terminate branch circuit equipment grounding conductors on solidly bonded equipment ground bus only. Do not terminate on isolated/insulated ground bus.
    2. Terminate branch circuit isolated grounding conductors on isolated/insulated ground bus only. Do not terminate on solidly bonded equipment ground bus.

K. Install all field-installed branch devices, components, and accessories.

L. Provide filler plates to cover unused spaces in panelboards.

M. Provide circuit breaker lock-on devices to prevent unauthorized personnel from de-energizing essential loads where indicated.

N. Identify panelboards in accordance with Section 26 0553.

O. Provide typed circuit directory for each branch circuit panelboard. Revise directory to reflect circuiting changes required to balance phase loads. Revise directory to reflect changes in room names and numbering as required by DSG. Also, identify the panelboard source on the directory card.

### 3.03 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for additional requirements.

B. Inspect and test in accordance with NETA ATS, except Section 4.

C. Molded Case Circuit Breakers: Perform inspections and tests listed in NETA ATS, Section 7.6.1.1. Tests listed as optional are not required.

D. Ground Fault Protection Systems: Test in accordance with manufacturer's instructions as required by NFPA 70.

E. Test GFCI circuit breakers to verify proper operation.

F. Correct deficiencies and replace damaged or defective panelboards or associated components.

### 3.04 ADJUSTING

A. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.

B. Adjust alignment of panelboard fronts.

C. Load Balancing: For each panelboard, rearrange circuits such that the difference between each measured steady state phase load does not exceed 20 percent and adjust circuit directories accordingly. Maintain proper phasing for multi-wire branch circuits.

### 3.05 CLEANING

A. Clean dirt and debris from panelboard enclosures and components according to manufacturer's instructions.

B. Repair scratched or marred exterior surfaces to match original factory finish.

**END OF SECTION**

# SECTION 26 2726
# WIRING DEVICES

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Wall switches.

B. Wall dimmers.

C. Receptacles.

D. Wall plates.

E. Floor box service fittings.

F. Poke-through assemblies.

G. Access floor boxes.

### 1.02 RELATED REQUIREMENTS

A. Section 26 0533.16 - Boxes for Electrical Systems.

### 1.03 REFERENCE STANDARDS

A. FS W-C-596 - Connector, Electrical, Power, General Specification for; Revision H, 2014.

B. FS W-S-896 - Switches, Toggle (Toggle and Lock), Flush-mounted (General Specification); Revision G, 2014.

C. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.

D. NECA 130 - Standard for Installing and Maintaining Wiring Devices; 2010.

E. NEMA WD 1 - General Color Requirements for Wiring Devices; 1999 (R2015).

F. NEMA WD 6 - Wiring Devices - Dimensional Specifications; 2016.

G. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

H. UL 20 - General-Use Snap Switches; Current Edition, Including All Revisions.

I. UL 498 - Attachment Plugs and Receptacles; Current Edition, Including All Revisions.

J. UL 514D - Cover Plates for Flush-Mounted Wiring Devices; Current Edition, Including All Revisions.

K. UL 943 - Ground-Fault Circuit-Interrupters; Current Edition, Including All Revisions.

L. UL 1472 - Solid-State Dimming Controls; Current Edition, Including All Revisions.

### 1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate the placement of outlet boxes with millwork, furniture, equipment, etc. installed under other sections or by others.
   2. Coordinate wiring device ratings and configurations with the electrical requirements of actual equipment to be installed.
   3. Coordinate the installation and preparation of uneven surfaces, such as split face block, to provide suitable surface for installation of wiring devices.
   4. Notify Architect of any conflicts or deviations from the contract documents to obtain direction prior to proceeding with work.

B. Sequencing:
   1. Do not install wiring devices until final surface finishes and painting are complete.

### 1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's catalog information showing dimensions, colors, and configurations.

## PART 2 PRODUCTS

### 2.01 WIRING DEVICE APPLICATIONS

A. Provide wiring devices suitable for intended use and with ratings adequate for load served.

B. For single receptacles installed on an individual branch circuit, provide receptacle with ampere rating not less than that of the branch circuit.

C. Provide weather resistant GFCI receptacles with specified weatherproof covers for receptacles installed outdoors or in damp or wet locations.

D. Provide GFCI protection for receptacles installed within 6 feet (1.8 m) of sinks.

E. For flush floor service fittings, use carpet flanges for installations in carpeted floors.

### 2.02 WIRING DEVICE FINISHES

A. Provide wiring device finishes as described below unless otherwise indicated.

B. Wiring Devices, Unless Otherwise Indicated: White with white nylon wall plate.

C. Wiring Devices Installed in Wet or Damp Locations: White with specified weatherproof cover.

D. Isolated Ground Convenience Receptacles: Orange.

E. Flush Floor Box Service Fittings: White wiring devices with brass cover and ring/flange.

### 2.03 WALL SWITCHES

A. Manufacturers:
   1. Hubbell Incorporated: www.hubbell-wiring.com.
   2. Leviton Manufacturing Company, Inc: www.leviton.com.
   3. Pass & Seymour, a brand of Legrand North America, Inc: www.legrand.us

B. Wall Switches - General Requirements: AC only, quiet operating, general-use snap switches with silver alloy contacts, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 20 and where applicable, FS W-S-896; types as indicated on the drawings.
   1. Wiring Provisions: Terminal screws for side wiring and screw actuated binding clamp for back wiring with separate ground terminal screw.

C. Standard Wall Switches: Commercial specification grade, 20 A, 120/277 V with standard toggle type switch actuator and maintained contacts; single pole single throw, double pole single throw, three way, or four way as indicated on the drawings.

D. Furnish and install narrow boxes and switches for use in store-front window systems where indicated.

### 2.04 WALL DIMMERS

A. Wall Dimmers - General Requirements: Solid-state with continuous full-range even control following square law dimming curve, integral radio frequency interference filtering, power failure preset memory, air gap switch accessible without removing wall plate, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 1472; types and ratings suitable for load controlled as indicated on the drawings.

### 2.05 RECEPTACLES

A. Manufacturers:
   1. Hubbell Incorporated: www.hubbell-wiring.com.
   2. Leviton Manufacturing Company, Inc: www.leviton.com.
   3. Pass & Seymour, a brand of Legrand North America, Inc: www.legrand.us
   4. Source Limitations: Where wall controls are furnished as part of lighting control system, provide accessory matching receptacles and wallplates by the same manufacturer in locations indicated.

B. Receptacles - General Requirements: Heavy duty, self-grounding, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 498, and where applicable, FS W-C-596; types as indicated on the drawings.

1. Wiring Provisions: Terminal screws for side wiring or screw actuated binding clamp for back wiring with separate ground terminal screw.
2. NEMA configurations specified are according to NEMA WD 6.

C. Convenience Receptacles:
1. Standard Convenience Receptacles: Commercial specification grade, 20A, 125V, NEMA 5-20R; single or duplex as indicated on the drawings.
2. Isolated Ground Convenience Receptacles: Commercial specification grade, 20A, 125V, NEMA 5-20R, with ground contacts isolated from mounting strap; isolated ground triangle mark on device face; single or duplex as indicated on the drawings.

D. GFCI Receptacles:
1. GFCI Receptacles - General Requirements: Self-testing, with feed-through protection and light to indicate ground fault tripped condition and loss of protection; listed as complying with UL 943, class A.
a. Provide test and reset buttons of same color as device.
2. Standard GFCI Receptacles: Commercial specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style.

E. Telephone Jack: Modular jack, flush mount, conductors as required (4-pair minimum). White cover.

## 2.06 WALL PLATES

A. Manufacturers:
1. Hubbell Incorporated: www.hubbell-wiring.com.
2. Leviton Manufacturing Company, Inc: www.leviton.com.
3. Pass & Seymour, a brand of Legrand North America, Inc: www.legrand.us

B. Wall Plates: Comply with UL 514D.
1. Configuration: One piece cover as required for quantity and types of corresponding wiring devices.
2. Size: Standard.
3. Screws: Metal with slotted heads finished to match wall plate finish.

C. Weatherproof Covers for Damp Locations: Gasketed, cast aluminum, with self-closing hinged cover and corrosion-resistant screws; listed as suitable for use in wet locations with cover closed.

D. Weatherproof Covers for Wet Locations: Gasketed, cast aluminum, with hinged lockable cover and corrosion-resistant screws; listed as suitable for use in wet locations while in use with attachment plugs connected and identified as extra-duty type.

## 2.07 FLOOR BOX SERVICE FITTINGS

A. Manufacturers:
1. Hubbell Incorporated; Model S3825 Brass: www.hubbell-wiring.com.
2. Thomas & Betts Corporation: www.tnb.com.
3. Wiremold, a brand of Legrand North America, Inc: www.legrand.us

B. Description: Service fittings compatible with floor boxes provided under Section 26 0533.16 with components, adapters, and trims required for complete installation.

C. Flush Floor Service Fittings:
1. Single Service Flush Convenience Receptacles:
a. Cover: Rectangular.
b. Configuration: One standard convenience duplex receptacle(s) with duplex flap opening(s).
2. Single Service Flush Communications Outlets:
a. Cover: Rectangular.
b. Configuration: 2-1/8 x one inch (54 x 25 mm), combination threaded opening.
3. Protective Ring: Brass finish.
4. Split Nozzle: Brass finish.

5. Carpet Ring: B Hubbell - SB3084 - Brass.

### 2.08 ACCESS FLOOR BOXES

A. Manufacturers - Access Floor Boxes:
   1. Hubbell Incorporated: www.hubbell-wiring.com.
   2. Thomas & Betts Corporation: www.tnb.com.
   3. Wiremold, a brand of Legrand North America, Inc: www.legrand.us

B. Description: Metallic multi-service box suitable for mounting in access floor system specified in Division 09.

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate devices and conductors in accordance with NFPA 70.

C. Verify that wall openings are neatly cut and will be completely covered by wall plates.

D. Verify that final surface finishes are complete, including painting.

E. Verify that floor boxes are adjusted properly.

F. Verify that branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.

G. Verify that conditions are satisfactory for installation prior to starting work.

### 3.02 PREPARATION

A. Provide extension rings to bring outlet boxes flush with finished surface.

B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

### 3.03 INSTALLATION

A. Perform work in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards unless otherwise indicated.

B. Coordinate locations of outlet boxes provided under Section 26 0533.16 as required for installation of wiring devices provided under this section.
   1. Mounting Heights for all electrical devices shall comply with ADA.
      a. Wall Switches: 48 inches (1200 mm) above finished floor to centerline. Where located near doors, install switches on the lock side and clear of door trim a minimum of 2 inches and a maximum of 10 inches.
      b. Receptacles: 18 inches (450 mm) above finished floor to centerline or 2 inches (50 mm) above counter.
      c. Telephone Outlets: 18 inches (450 mm) above finished floor to centerline or 48 inches (1200 mm) above finished floor to centerline for wall telephone outlets.
      d. Cooridinate all rough-in with architectural interior elevations.
   2. Where multiple receptacles, wall switches, or wall dimmers are installed at the same location and at the same mounting height, gang devices together under a common wall plate.

C. Install wiring devices in accordance with manufacturer's instructions.

D. Where required, connect wiring devices using pigtails not less than 6 inches (150 mm) long. Do not connect more than one conductor to wiring device terminals.

E. Connect wiring devices by wrapping conductor clockwise 3/4 turn around screw terminal and tightening to proper torque specified by the manufacturer. Where present, do not use push-in pressure terminals that do not rely on screw-actuated binding.

F. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.

G. For isolated ground receptacles, connect wiring device grounding terminal only to identified branch circuit isolated equipment grounding conductor. Do not connect grounding terminal to outlet box or normal branch circuit equipment grounding conductor.

H. Install wiring devices plumb and level with mounting yoke held rigidly in place.

I. Install wall switches with OFF position down.

J. Install wall dimmers to achieve full rating specified and indicated after derating for ganging as instructed by manufacturer.

K. Do not share neutral conductor on branch circuits utilizing wall dimmers.

L. Install blank wall plates on junction boxes and on outlet boxes with no wiring devices installed or designated for future use.

M. Electrical outlets located on interior columns shall be centered laterally. Conform to ADA mounting heights.

N. Install decorative plates on switch, receptacle and blank outlets in finished areas.

O. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings and on surface mounted outlets.

**3.04 FIELD QUALITY CONTROL**

A. See Section 01 4000 - Quality Requirements, for additional requirements.

B. Inspect each wiring device for damage and defects.

C. Operate each wall switch, wall dimmer, and fan speed controller with circuit energized to verify proper operation.

D. Test each receptacle to verify operation and proper polarity.

E. Test each GFCI receptacle for proper tripping operation according to manufacturer's instructions.

F. Verify that each telephone jack is properly connected and circuit is operational.

G. Correct wiring deficiencies and replace damaged or defective wiring devices.

**3.05 ADJUSTING**

A. Adjust devices and wall plates to be flush and level.

**3.06 CLEANING**

A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

**END OF SECTION**

**SECTION 26 5100**

**INTERIOR LIGHTING**

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Interior luminaires.

B. Emergency lighting units.

C. Exit signs.

D. Ballasts and drivers.

E. Luminaire accessories.

### 1.02 RELATED REQUIREMENTS

A. Section 26 0533.16 - Boxes for Electrical Systems.

B. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.

C. Section 26 0919 - Enclosed Contactors: Lighting contactors.

D. Section 26 0923 - Lighting Control Devices: Automatic controls for lighting including occupancy sensors, outdoor motion sensors, time switches, outdoor photo controls, and daylighting controls.

E. Section 26 2726 - Wiring Devices: Manual wall switches and wall dimmers.

F. Section 26 5600 - Exterior Lighting.

### 1.03 REFERENCE STANDARDS

A. IES LM-79 - Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products; 2008.

B. IES LM-80 - Approved Method: Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays, and Modules; 2015.

C. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.

D. NECA/IESNA 500 - Standard for Installing Indoor Commercial Lighting Systems; 2006.

E. NECA/IESNA 502 - Standard for Installing Industrial Lighting Systems; 2006.

F. NEMA 410 - Performance Testing for Lighting Controls and Switching Devices with Electronic Drivers and Discharge Ballasts; 2015.

G. NEMA LE 4 - Recessed Luminaires, Ceiling Compatibility; 2012.

H. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

I. NFPA 101 - Life Safety Code; 2015.

J. UL 924 - Emergency Lighting and Power Equipment; Current Edition, Including All Revisions.

K. UL 1598 - Luminaires; Current Edition, Including All Revisions.

L. UL 8750 - Light Emitting Diode (LED) Equipment for Use in Lighting Products; Current Edition, Including All Revisions.

### 1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate the installation of luminaires with mounting surfaces installed under other sections or by others. Coordinate the work with placement of supports, anchors, etc. required for mounting. Coordinate compatibility of luminaires and associated trims with mounting surfaces at installed locations.

2. Coordinate the placement of luminaires with structural members, ductwork, piping, equipment, diffusers, fire suppression system components, and other potential conflicts installed under other sections or by others.
3. Coordinate the placement of exit signs with furniture, equipment, signage or other potential obstructions to visibility installed under other sections or by others.
4. Notify Architect of any conflicts or deviations from the contract documents to obtain direction prior to proceeding with work.

**1.05 SUBMITTALS**

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings:
1. Indicate dimensions and components for each luminaire that is not a standard product of the manufacturer.
2. Provide photometric calculations where luminaires are proposed for substitution upon request.

C. Product Data: Provide manufacturer's standard catalog pages and data sheets including detailed information on luminaire construction, dimensions, ratings, finishes, mounting requirements, listings, service conditions, photometric performance, installed accessories, and ceiling compatibility; include model number nomenclature clearly marked with all proposed features.
1. LED Luminaires:
a. Include estimated useful life, calculated based on IES LM-80 test data.
2. Lamps: Include rated life, color temperature, color rendering index (CRI), and initial and mean lumen output.

D. Certificates for Dimming Ballasts: Manufacturer's documentation of compatibility with dimming controls to be installed.

E. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

F. Operation and Maintenance Data: Instructions for each product including information on replacement parts.

**1.06 QUALITY ASSURANCE**

A. Conform to requirements of NFPA 70.

B. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

**1.07 DELIVERY, STORAGE, AND PROTECTION**

A. Receive, handle, and store products according to NECA/IESNA 500 (commercial lighting), NECA/IESNA 502 (industrial lighting), and manufacturer's written instructions.

B. Keep products in original manufacturer's packaging and protect from damage until ready for installation.

**PART 2 PRODUCTS**

**2.01 LUMINAIRE TYPES**

A. Luminaires, poles and all accessories furnished by Vendor #18. Point of Contact: Mr. Don Barr (614) 771-7366 - office, (614) 395-9990 - cell. Furnish products as indicated in luminaire schedule included on the drawings.

B. Furnish products as indicated in luminaire schedule included on the drawings.

C. Substitutions: Not Permitted.

**2.02 LUMINAIRES**

A. Provide products that comply with requirements of NFPA 70.

B. Provide products that are listed and labeled as complying with UL 1598, where applicable.

C. Provide products listed, classified, and labeled as suitable for the purpose intended as specified on drawings. For fire rated ceiling assemblies, furnish products listed for installation in the assembly.

D. Unless otherwise indicated, provide complete luminaires including lamp(s) and all sockets, ballasts, reflectors, lenses, housings and other components required to position, energize and protect the lamp and distribute the light.

E. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, hardware, supports, trims, accessories, etc. as necessary for a complete operating system.

F. Provide products suitable to withstand normal handling, installation, and service without any damage, distortion, corrosion, fading, discoloring, etc.

G. Recessed Luminaires:
   1. Ceiling Compatibility: Comply with NEMA LE 4.
   2. Luminaires Recessed in Insulated Ceilings: Listed and labeled as IC-rated, suitable for direct contact with insulation and combustible materials.

H. LED Luminaires:
   1. Components: UL 8750 recognized or listed as applicable.
   2. Tested in accordance with IES LM-79 and IES LM-80.
   3. LED Estimated Useful Life: Minimum of 50,000 hours at 70 percent lumen maintenance, calculated based on IES LM-80 test data.
   4. LED light sources and driver shall be RoHS compliant with internal components assembled using modular components.
   5. Input wattage, voltage and lumen output shall be as specified on the drawings. Values shown are design minimums and must be verified with plans.

I. Track Lighting Systems: Provide track compatible with specified track heads, with all connectors, power feed fittings, dead ends, hangers and canopies as necessary to complete installation.

**2.03 EMERGENCY LIGHTING UNITS**

A. Description: Self-contained emergency lighting units complying with NFPA 101 and all applicable state and local codes, and listed and labeled as complying with UL 924.

B. Operation: Upon interruption of normal power source or brownout condition exceeding 20 percent voltage drop from nominal, solid-state control automatically switches connected lamps to integral battery power for minimum of 90 minutes of rated emergency illumination, and automatically recharges battery upon restoration of normal power source.
   1. Battery Charger: Dual-rate type, with sufficient capacity to recharge discharged battery to full charge within twelve hours.

C. Battery:
   1. Size battery to supply all connected lamps, including emergency remote heads where indicated.

D. Diagnostics: Provide power status indicator light and accessible integral test switch to manually activate emergency operation.

E. Provide low-voltage disconnect to prevent battery damage from deep discharge.

F. Lamps: Sealed beam type as scheduled.

G. Remote Lamps: Match lamps on unit.

H. Housing as scheduled by manufacturer's catalog data.

I. Indicators: Provide lamps to indicate AC ON and RECHARGING.

J. Electrical Connection: Conduit connection.

## 2.04 EXIT SIGNS

A. Description: Internally illuminated exit signs with LEDs unless otherwise indicated; complying with NFPA 101 and all applicable state and local codes, and listed and labeled as complying with UL 924.
   1. Face and Housing: As scheduled by manufacturer's catalog data. Single or double faces as indicated or as required for the installed location.
   2. Directional Arrows: Universal type for field adjustment.

B. Mounting: Universal, for field selection.

C. Self-Powered Exit Signs:
   1. Operation: Upon interruption of normal power source or brownout condition exceeding 20 percent voltage drop from nominal, solid-state control automatically switches connected lamps to integral battery power for minimum of 90 minutes of rated emergency illumination, and automatically recharges battery upon restoration of normal power source.
   2. Diagnostics: Provide power status indicator light and accessible integral test switch to manually activate emergency operation.
   3. Provide low-voltage disconnect to prevent battery damage from deep discharge.
   4. Battery Charger: Dual-rate type, with sufficient capacity to recharge discharged battery to full charge within twelve hours.

D. Lamps: Manufacturer's standard.

## 2.05 BALLASTS AND DRIVERS

A. Ballasts/Drivers - General Requirements:
   1. Provide ballasts containing no polychlorinated biphenyls (PCBs).
   2. Minimum Efficiency/Efficacy: Provide ballasts complying with all current applicable federal and state ballast efficiency/efficacy standards.
   3. Electronic Ballasts/Drivers: Inrush currents not exceeding peak currents specified in NEMA 410.

B. Dimmable LED Drivers:
   1. Drivers shall be dimming type 0-10V.
   2. Dimming Range: Continuous dimming from 100 percent to five percent relative light output unless dimming capability to lower level is indicated, without flicker.
   3. Control Compatibility: Fully compatible with the dimming controls to be installed.
      a. Wall Dimmers: See Section 26 2726.
      b. Daylighting Controls: See Section 26 0923.

## 2.06 ACCESSORIES

A. Stems for Suspended Luminaires: Steel tubing, minimum 1/2" size, factory finished to match luminaire or field-painted as directed.

B. Threaded Rods for Suspended Luminaires: Zinc-plated steel, minimum 1/4" size, field-painted as directed.

C. Provide accessory plaster frames for luminaires recessed in plaster ceilings.

# PART 3 EXECUTION

## 3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate conductors in accordance with NFPA 70.

C. Verify that suitable support frames are installed where required.

D. Verify that branch circuit wiring installation is completed, tested, and ready for connection to luminaires.

E. Verify that conditions are satisfactory for installation prior to starting work.

## 3.02 PREPARATION

A. Provide extension rings to bring outlet boxes flush with finished surface.

B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

## 3.03 INSTALLATION

A. Coordinate locations of outlet boxes provided under Section 26 0533.16 as required for installation of luminaires provided under this section.

B. Perform work in accordance with NECA 1 (general workmanship).

C. Install products in accordance with manufacturer's instructions.

D. Install luminaires securely, in a neat and workmanlike manner, as specified in NECA 500 (commercial lighting).

E. Install luminaires plumb and square and aligned with building lines and with adjacent luminaires.

F. Locate recessed ceiling luminaires as indicated on reflected ceiling plan.

G. All fixtures shall be furnished complete with suitable pendants, canopies, cover, ceiling roundels, opening flanges, hangers, plaster rings or frames, if recessed, and necessary rubber cords, chains or studs. The Electrical Contractor shall be responsible for the proper size openings for recessed fixtures and shall furnish and install all wood or metal frames properly set in place and anchored.

H. Mount fixtures as called for in lighting fixture schedule on drawings. Determine type of ceiling to be installed in each space from the architectural drawings and schedules and furnish fixtures suitable for the exact type.

I. Suspended Ceiling Mounted Luminaires:
   1. Do not use ceiling tiles to bear weight of luminaires.
   2. Do not use ceiling support system to bear weight of luminaires unless ceiling support system is certified as suitable to do so.
   3. Support luminaires larger than 2 x 4 foot (600 x 1200 mm) size independent of ceiling framing.
   4. Secure surface-mounted and recessed luminaires to ceiling support channels or framing members or to building structure.
   5. Secure pendant-mounted luminaires to building structure.
   6. Secure lay-in luminaires to ceiling support channels using listed safety clips at four corners.
   7. See appropriate Division 9 section where suspended grid ceiling is specified for additional requirements.
   8. Provide auxiliary members spanning ceiling Ts to support surface mounted luminaires. Fasten surface mounted luminaires to ceiling T using bolts, screws, rivets, or suitable clips.
   9. For seismic areas, support surface mounted luminaires on grid ceiling directly from building structure.

J. Recessed Luminaires:
   1. Install trims tight to mounting surface with no visible light leakage. Fixture housing, frame or canopy shall provide a suitable cover for the fixture outlet box of fixture opening.
   2. Non-IC Rated Luminaires: Maintain required separation from insulation and combustible materials according to listing.
   3. Install recessed luminaires to permit removal from below.
   4. Luminaires Recessed in Fire-Rated Ceilings: Install using accessories and firestopping materials to meet regulatory requirements for fire rating.
   5. Where sloping ceilings occur, all recessed fixtures shall be of a type designed for the application and shall be mounted to provide proper lighting.

K. Suspended Luminaires:

1. Unless otherwise indicated, specified mounting heights are to bottom of luminaire.
2. Install using the suspension method indicated, with support lengths and accessories as required for specified mounting height.
3. Provide minimum of two supports for each luminaire equal to or exceeding 4 feet nominal length, with no more than 4 feet (1.2 m) between supports.
4. Install canopies tight to mounting surface.
5. Unless otherwise indicated, support pendants from swivel hangers.

L. Unless otherwise directed, all pendant fixtures within the same room or area shall be installed plumb and at a uniform height from the finished floor. Adjustment of height shall be made during installation.

M. Install wall mounted luminaires, emergency lighting units and exit signs at height as indicated on drawings. Outlet boxes are required. Wall mounted fixtures shall be secured to masonry walls with bolts and lead anchors, and to metal stud, dry wall partitions by sheet metal screws driven into metal studs

N. Install accessories furnished with each luminaire.

O. Connect luminaires, emergency lighting units and exit signs to branch circuit outlets provided under Section 26 0533.16 using flexible conduit.

P. Make wiring connections to branch circuit using building wire with insulation suitable for temperature conditions within luminaire.

Q. Bond products and metal accessories to branch circuit equipment grounding conductor.

R. Emergency Lighting Units:
1. Unless otherwise indicated, connect unit to unswitched power from same circuit feeding normal lighting in same room or area. Bypass local switches, contactors, or other lighting controls.
2. Install lock-on device on branch circuit breaker serving units.

S. Exit Signs:
1. Unless otherwise indicated, connect unit to unswitched power from same circuit feeding normal lighting in same room or area. Bypass local switches, contactors, or other lighting controls.
2. Install lock-on device on branch circuit breaker serving units.

T. Remote Ballasts: Install in accessible location as indicated or as required to complete installation, using conductors per manufacturer's recommendations not exceeding manufacturer's recommended maximum conductor length to luminaire.

U. Install lamps in each luminaire, emergency lighting unit and exit sign as applicable.

**3.04 FIELD QUALITY CONTROL**

A. See Section 01 4000 - Quality Requirements, for additional requirements.

B. Inspect each product for damage and defects.

C. Operate each luminaire after installation and connection to verify proper operation.

D. Test self-powered exit signs and emergency lighting units to verify proper operation upon loss of normal power supply.

E. Correct wiring deficiencies and repair or replace damaged or defective products. Repair or replace excessively noisy ballasts as determined by Architect.

**3.05 ADJUSTING**

A. Aim and position adjustable luminaires to achieve desired illumination as indicated or as directed by Architect. Secure locking fittings in place.

B. Aim and position adjustable emergency lighting unit lamps to achieve optimum illumination of egress path as required or as directed by Architect or authority having jurisdiction.

C. Exit Signs with Field-Selectable Directional Arrows: Set as indicated or as required to properly designate egress path as directed by Architect or authority having jurisdiction.

## 3.06 CLEANING

A. Clean surfaces according to NECA 500 (commercial lighting) and manufacturer's instructions to remove dirt, fingerprints, paint, or other foreign material and restore finishes to match original factory finish.

B. Clean electrical parts to remove conductive and deleterious materials.

C. Clean photometric control surfaces as recommended by manufacturer.

## 3.07 CLOSEOUT ACTIVITIES

A. Demonstration: Demonstrate proper operation of luminaires to Architect, and correct deficiencies or make adjustments as directed.

B. Just prior to Substantial Completion, replace all lamps that have failed.

## 3.08 PROTECTION

A. Protect installed luminaires from subsequent construction operations.

**END OF SECTION**

**SECTION 27 0741**

**TELEPHONE / DATA / POS SERVICE, PATHWAYS AND WIRING**

## PART 1- GENERAL

### 1.01 SECTION INCLUDES

A. Telephone service entrance raceway.

B. Equipment and terminal backboards.

C. Premise wiring.

D. Wiring devices and terminations.

E. Identification

F. Testing

### 1.02 RELATED REQUIREMENTS

A. Section 26 0100 - Basic Electrical Requirements

B. Section 26 0533.13 - Conduit for Electrical Systems

### 1.03 SYSTEM'S DESCRIPTION

A. For all future references, the use of the word "provide" shall mean "to furnish and install".

B. For all future references, the use of DSG refers to Dick's Sporting Goods.

C. The Electrical Contractor, in conjunction with DSG's National Account Vendor No. 13, shall provide a complete Telephone, Data and POS (Point of Sale) Communication's system.

D. Vendor No. 13 shall provide all Telephone, Audio Visual and Data Equipment cabling and/or devices, programming, Trafsys components, Cisco wireless phone system components, Indyme wireless call boxes / components/server, cable management devices (excluding Electrical Contractor provided raceways of conduit), cabling, jacks, identification and labeling, testing, coordination with local exchange carriers and all other trades including other National Account Vendors for DSG, terminations, and inspections required by the AHJ (Authority Having Jurisdiction) or as noted in the Project's General Conditions.

E. The Electrical Contractor shall contact DSG's National Account Vendor No. 13 in order to secure a quote for the Work indicated in the Project Documents, including the specifications and drawings. Vendor No. 13 shall provide a quote based on their National Account Agreement with DSG and other Project specific criteria and/or requirements.

F. DSG shall provide the Back Office equipment, routers, network switches, CRT's, printers, and Cisco wireless antennae/components for each location. DSG's separate Subcontractor shall install, interconnect and test the DSG furnished equipment.

G. This portion of the Work shall be completed 4 weeks prior to receipt of the store's merchandise in order that the systems are available for use by DSG during merchandise receipt.

H. Telephone Service Entrance Pathway: The Electrical Contractor shall provide (2) 4-inch conduits (including all associated pull boxes) with pullwires from Local Exchange Carrier's demarcation point to DSG's building Special Systems Backboard as indicated on drawings. DSG's National Account Vendor No. 13 shall provide telephone pair cabling (quantity of pairs indicated on drawings) from Local Exchange Carrier's demarcation location to DSG's building Special Systems Backboard. Electrical Contractor and DSG Low Voltage Vendor (No. 13) shall coordinate Local Exchange Carrier's demarcation location and incoming raceway installation with Local Exchange Carrier, General Contractor and DSG Project Construction Manager prior to rough in. Vendor No. 13 shall confirm type of telephone pair cabling required for the project with local conditions and AHJ (plenum rated or PVC jacketing). If PVC jacketed and local AHJ requires continuous conduit raceway from connection point to MDF backboard, then Electrical Contractor shall provide continuous rigid conduit raceway. TI high speed service cabling shall be provided by Local High Speed Internet Service Provider.

I. Backbone Pathway: Conform to EIA/TIA 569 using conduit as indicated.

J. Horizontal Pathway: Conform to EIA/TIA 569, using raceway, backboards, and cabinets as indicated.

K. Premises Wiring: Complete from voice/data locations to its respective termination point using cable as specified.

L. Voice and data outlets shall consist of a devices box and cover plate with 3/4 inch conduit installed from voice / data outlet to nearest accessible ceiling provided by Electrical Contractor. Terminate with end bushings in ceiling space. Install pull wire or cord in empty conduit. Coordinate installation with Vendor No. 13.

**1.04 PROJECT RECORD DOCUMENTS**

A. Drawings shall be based upon the final documents, including all changes. They must include the specific location and identification of all: equipment, panels, devices and all other pertinent items. Drawings shall include specific identification corresponding to tagging of all equipment, panels, devices, telephone cables, data cables, controls, antennae and the like.

B. Drawings shall be clearly identified as “RECORD DRAWINGS” and shall be dated to indicate the date of the latest information contained there on. Drawings shall also provide explicit written certification that the certification that the Contractor has reviewed the actual as constructed conditions with the Owner’s representative and contain the representative’s endorsement and concurrence with all information contained on the drawings. Any required revisions shall be made as directed prior to final release of retention.

C. Submit written results from testing as outlined in 3.02 of this Section.

D. Provide empty conduit for TI in AV Room.

**1.05 QUALITY ASSURANCE**

A. The routing of this cabling shall be done in conformance with EIA/TIA-569B.1 wiring standards and BICSI Telecommunications Distribution Methods Manual.

B. The Electrical Contractor, prior to beginning the Work, shall arrange a Pre-installation Conference. The conference should include discussions regarding terminations, cabling, routing and identification schemes and other pertinent issues relating to the Telephone and Data Systems. Attendees should include, but not necessarily be limited to, the General Contractor, company representative from the National Account Vendor, Landlord, DSG Project Construction Manager and any other attendees deemed necessary by the Electrical Contractor.

C. The Electrical Contractor shall provide all necessary labor to assist the DSG’s Project Construction Manager, DSG’s Vendors or their agents in checking out and identifying any difficulties or improprieties in the installation and ALL the troubleshooting and correction associated therewith.

**PART 2 - PRODUCTS**

**2.01 TELEPHONE TERMINATION BACKBOARDS**

A. Material: Plywood - ¾ inch, finished grade one side.

B. Size: Special Systems Backboard - 8x8 feet, ¾ inch thick, flame-retardant. IDF Backboard - 2x2 feet, ¾”, flame-retardant

**2.02 CONDUIT**

A. 3/4 inch minimum size. Refer to Section 26 0533.13 for allowable types. Extend all conduits to accessible locations above ceiling. If no ceiling is present, then the conduit shall be extended to the bottom of the roof’s bar joist for cable routing.

**2.03 CABLING**

A. The Voice cabling for each device and/or station to be provided, to be installed from each device location to the indicated IDF or Telephone MDF, shall be CAT 6, 4 pair, unshielded, twisted, PVC, 24 gauge, solid copper conductor with white jacketing with a 25 year warranty, complying with TIA 568-B.1. The routing of this cabling shall be done in conformance with EIA/TIA-569 wiring standard and BICSI Telecommunications Distribution Methods Manual.

Communications cabling shall be continuous (i.e., there will be no splices) from each device to its respective termination point. Electrical Contractor to note wall elevations and equipment layout at the Special Systems Backboard that indicates designated landing areas for Telephone, POS Data and other device cabling. The cabling shall be properly identified and tagged per the noted criteria, which will be left with fifteen (15) feet of slack, coiled for termination at the IDF(s) or MDF.

B. The POS and Data cabling for each device and/or station, including but not limited to CRT's, time clocks, RF and wireless phone system's antennae, POS units, upload ports, to be provided from each device location to the indicated IDF or Data MDF shall be CAT 6, 4 pair, unshielded, twisted, PVC, 24 gauge, solid copper conductor with white jacketing with a 25 year warranty and complying with TIA 568-B.1. The routing of this cabling shall be done in conformance with EIA/TIA 569 wiring standards and BICSI Telecommunications Distribution Methods Manual. Communications cabling shall be continuous (i.e., there will be no splices) from each device to its respective termination point. Electrical Contractor to note wall elevations and equipment layout at the Special Systems Backboard that indicates designated landing areas for POS and Data cabling. The cabling shall be properly identified and tagged per the noted criteria and left with fifteen feet of slack coiled for termination at the IDF or MDF.

C. The Fiber Optic Cable from each IDF location to the MDF data Rack to be provided shall be a multimode 62.5/125 Um, 6 stand, PVC, armored with a white jacket and complying with TIA 568-B.1. Cabling shall be installed and tested per the EIA/TIA-568-B.1 "Commercial Building Telecommunications Cabling Standards", and any subsequent updates or modifications to those standards.

D. The telephone service pair communication cable (quantity to match incoming service pair quantity) from the IDF to the Telephone MDF to be provided shall be a CAT 3, 24 awg, PVC white jacketed. Electrical Contractor shall provide conduit raceway if required.

### 2.04 ACCESSORIES AND EQUIPMENT

A. Equipment: The National Account Vendor No. 13 shall provide the equipment and services per their agreement with DSG and it shall be provided as a part of this Work, along with any project specific requirements.

B. Termination Jacks: RJ-45 type jacks provided as noted in the National Account Store Installation Material Configuration and as manufactured by NTW (Network The World) or an approved equal.

C. Data jack colors as noted: 1st data jack at location, Green; 2nd data jack at location, White; 3rd data jack at location, Slate; 4th data jack at location, Blue. Red for all Access Points. All data jacks to support CAT 6 cabling.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

A. General Contractor is to finish paint termination backboards with durable gray enamel under the provisions of Division 9 prior to installation of telephone equipment.

B. General Contractor is to support raceways and backboards under the provisions of Section 26 0529.

C. General Contractor is to Install termination backboards plumb, and attach securely to building wall at each corner.

D. Electrical Subcontractor is to Install polyethylene pulling string in each empty conduit raceway.

E. General Contractor to mark all backboards with the legend "TELEPHONE" under the provisions of Section 26 0553.

F. Contact National Account Vendor No. 13.

G. Identify each conductor at termination point as to location of jack or outlet served.

H. Provide rough-in boxes to facilitate the installation of the proposed port configuration single or multiple including dual or quad ports. Provide a single J box.

I. Cabling in walls, mechanical spaces, elevator hoist and other areas as defined by the NEC shall be installed in conduit and extended as required.

J. All cabling shall be supported to the building structure and run in such a manner as to diminish the ability to view the cabling from any sales area or customer view. Cabling shall be installed at 90 degree right angle runs. Cabling shall not be attached to any other Work including but not limited to fire protection piping, plumbing lines, HVAC ductwork or equipment, ceiling support systems including tie wires for same and or electrical conduits. Provide all ancillary support components and cable management devices to comply with the NEC and ANSI/TIA/EIA installation requirements and/or requirements of the AHJ.

K. Avoid installations that subject the cabling to be near sources of EMI.

L. Data cable runs shall not exceed 290 LF without the expressed written consent of DSG or DSG's authorized agent.

M. Terminations and termination devices including faceplates for all cabling provided shall be done as a part of the Work.

**3.02 CABLE TESTING**

A. The CAT 6 cables shall be installed with zero defective pairs per cable sheath. The cable shall be tested for shorts, crosses, opens, grounds, transpositions, splits and to minimum data rate of 1000 Mbps, with results of test recorded on industry standard test result form with a separate page for each cable. In addition to the submission required as part of the project "Record" documentation, Submit test results directly to Steward Osborn, Manager of IT Support c/o Dick's Sporting Goods, , Telephone (724.273.3412) immediately upon completion of testing.

B. Test results shall verify that the installed performance is in agreement with the cable manufacturer's rated minimum performance indicated on accepted submittals.

C. Test report shall indicate the following: NEXT - near end crosstalk, attenuation, length of run, impedance, loop resistance, capacitance, ACR, attenuation to crosstalk ratio, performance grade, signal to noise ratio, skew, and noise.

D. All Fiber Optic Cables shall be tested in accord with ANSI/TIAEIA-526-14A and meet the performance specifications of TIA/EIA-568-B.1

E. Written test results for all cabling provided shall be provided to the Owner prior to the Owners acceptance of this Work.

F. In the event of testing criteria failure after Electrical Contractor sign off, the Electrical Contractor shall provide immediate call back and provide laborer to remedy situation within 4 hours of first contact.

**END OF SECTION**

## SECTION 28 2743

## E.A.S. SYSTEM AND CCTV SYSTEM

### PART 1 - GENERAL

### 1.01 E.A.S. SYSTEM AND CCTV SYSTEM EQUIPMENT

A. General Contractor to purchase equipment and installation for the E.A.S. System (Anti-Shoplifting System), and CCTV System (Surveillance Cameras) from Vendor 19.

B. Contractor shall provide all electrical components and work required for the EAS and CCTV equipment installation. Coordinate scope of work with Vendor 19.

### 1.02 SUBMITTALS

A. Prior to installation, submit to the AOR for review, the following:
   1. Shop drawings and manufacturer's literature that shall include, but not be limited to, description of materials and operating components, dimensions, and camera blueprint layout that has been approved by DSG loss prevention.

### 1.03 DELIVERY, STORAGE AND HANDLING

A. General Contractor is responsible for securely storing materials to prevent damage and theft. Strictly adhere to manufacturer's instructions.

### PART 2 - PRODUCTS

### 2.01 VENDOR CONTACT INFORMATION

A. All equipment and installation is to be contracted through Sensormatic Electronics (Vendor 19), DSG's National Account manager, Jeff Dye at 440.846.6086.

B. All Sensormatic installation questions are to be directed to Sensormatic Project Manager Francesca Ciglar at 954.242.2237 or via e-mail at francesca.ciglar@jci.com.

### 2.02 MATERIALS

A. Security Post and CCTV Systems
   1. E.A.S. Security System (Anti-Shoplifting System) at front vestibule (and at mall entry if applicable)
   2. CCTV System (Surveillance Cameras) throughout the store

### PART 3 - EXECUTION

### 3.01 INSTALLATION

A. Vendor 19 to furnish and install all systems under contract with the General Contractor.

### 3.02 E.A.S. SYSTEM EQUIPMENT LOCATIONS

A. The E.A.S. System is to be installed at Vestibule or main entrance to a single level DSG store.

B. The E.A.S. System is to be installed at All Exterior and Mall entrances to a two-level DSG store.

C. The E.A.S. System is to be installed at mall entrances.

D. The E.A.S. System is to be installed at Dick's Golf Shop entrances.

**END OF SECTION**

## SECTION 28 3749
## BUILDING SECURITY

### PART 1 - GENERAL

### 1.01 BUILDING SECURITY EQUIPMENT

A. General Contractor to purchase and install all devices and wiring associated with the building security as supplied by Tyco.

B. All items related to this system and their locations to be coordinated and contracted through Tyco. Contact person to be Thad Henson @ 847-521-0536 or Jonathan Thomas @ 610-587-4106.

### PART 2 - PRODUCTS

### 2.01 VENDOR SCOPE

A. Tyco to supply Honeywell 7847i Internet Communication Module. This requires an IP connection to the security panel. Coordinate with Tyco Integrated Security. Contact person to be Thad Henson @ 847-521-0536.

### PART 3 - EXECUTION

**NOT USED**

**END OF SECTION**

## SECTION 28 4721

## ADDRESSABLE FIRE ALARM SYSTEM

### PART 1 - GENERAL

### 1.01 SCOPE

A. This specification document provides the requirements for the installation, programming and configuration of a complete addressable fire alarm system. This system shall include, but not be limited to, system cabinet, power supply, built in Signaling Line Circuit (SLC), 80 character LCD annunciator, six programmable outputs, built in dual line Digital Communicator, associated peripheral devices, batteries, wiring, conduit and other relevant components and accessories required to furnish a complete and operational Life Safety System.

### 1.02 GENERAL REQUIREMENTS

A. The General Contractor shall design, furnish and install a complete 24 VDC, electrically supervised, addressable fire alarm system as specified herein. The system shall include but not be limited to all control panels, power supplies, initiating devices, audible and visual notification appliances, alarm devices, and all accessories required to provide a complete operating fire alarm system.

B. The General Contractor will have sole responsibility for design and approval of a complete system by AHJ as well as other approvals, all monitoring of the system as required to obtain AHJ approval will be the responsibility of the contractor till the time vendor assumes monitoring as outlined in the following. The contractor will also have sole responsibility for the coordination of all device locations with all other trades to assure no conflict with building components and shall include store fixtures, murals, etc. All devices that interfere with or deemed unacceptable by the DSG Construction Project Manager will be relocated at no additional expense.

C. Subsequent to system installation, system startup, and system acceptance by Vendor #2, Vendor #2 will provide all system monitoring and after the 1st year warranty period per section 1.5 Vendor #2 will provide Maintenance.

### 1.03 LISTINGS

A. All fire alarm system equipment shall be listed for its intended purpose and be compatibility listed to assure the integrity of the complete system.

### 1.04 STANDARDS

A. The fire alarm equipment and installation shall comply with the current provisions of the following standards and shall be listed for its intended purpose and be compatibility listed to insure integrity of the complete system.
   1. National Electric Code, Article 760
   2. National Fire Protection Association Standards (NFPA):
      a. NFPA 70 - National Electrical Code
      b. NFPA 72 - National Fire Alarm Code
      c. NFPA 101 - Life Safety Code
   3. Underwriters Laboratories Inc.- All equipment shall be approved by Underwriters Laboratories, Inc. for its intended purpose, listed as power limited by Underwriters Laboratories, Inc., for the following standards as applicable:
      a. UL 864 UOJZ Control units for Fire Protective Signaling Systems
      b. Local Signaling Unit
      c. Central Station Signaling
      d. Protected Premises Unit
      e. Remote Signaling Protected Premises Unit.
      f. UL 268 Smoke Detectors for Fire Protective Signaling systems.
      g. UL 268A Smoke Detectors for duct applications
      h. UL 217 Smoke Detectors for Single Stations
      i. UL 521 Heat Detectors for Fire Protective Signaling systems.
      j. UL 228 Door Holders for Fire Protective Signaling systems.

k. UL 464 Audible Signaling appliances
l. UL 1638 Visual Signaling appliances
m. UL 38 Manually Activated Signaling Boxes
n. UL 346 Waterflow indicators for Fire Protective Signaling systems.
o. UL 1481 Power Supplies for Fire Protective Signaling systems.

4. Americans with Disabilities Act (ADA) - All visual Notification appliances and manual pull stations shall comply with the requirements of the Americans with Disabilities Act.

**1.05 QUALIFICATIONS**

A. Manufacturer: Company specializing in smoke detection and fire alarm systems with five years documented experience

B. Installer: Company specializing in smoke detection and fire alarm systems with five years documented experience as fire alarm subcontractor.

C. Manufacturers/Distributors Services:
1. The following supervision shall be provided by a factory trained service technician from the distributor of the fire alarm equipment. The technician shall be certified and shall have a minimum of two (2) years of service experience in the fire alarm industry. The technicians name shall appear on equipment submittals and a copy of his manufactures certification shall be included with the submittal information.
2. The technician shall be responsible for the following items:
a. A pre installation visit to the job site to review equipment submittals and to verify the method by which the system is to be wired.
b. During the installation the certified technician shall be on site or make periodic visits to verify installation and wiring of the system. He shall also supervise the completion of conduit rough-in, wires pulled into conduit and wiring rough-in, and ready for trim.
c. Certified technician along with Vendor #2 will certify completion of each phase of work which will at a minimum include completion of wiring, device installation and the final checkout of completed system.

**1.06 SUBMITTALS**

A. Submit under the provisions of Section 01 3000 along with submittal to Vendor # 2 for approval of all manufacturers' Model #s of proposed equipment. Vendor #2 review will be limited to the determination if proposed equipment is suitable to enter into Vendor #2's monitoring and Maintenance program. Indicated in the document will be the type, size, rating, style, catalog number, manufacturer's names, photos, and/or catalog data sheets for all items proposed to meet these specifications. The proposed equipment shall be subject to the approval of the AOR and no equipment shall be ordered or installed on the premises without their approval. Provide calculations to support the selection of back-up power supply batteries to support the requirements of Section 3.2.
1. NOTE: DOCUMENTATION - Submittal of shop drawings shall contain at least one copy of original manufacturer specification and installation instruction sheets along with an electronic submittal of same in PDF format. All equipment and devices on the shop drawings to be furnished under this contract shall be clearly marked in the specification sheets.

**1.07 WARRANTY**

A. Warrant all materials and labor for a one (1) year period after the later of occupancy by DSG or acceptance of system by Vendor #2. During warranty period all Emergency service request will be responded to within a 4 hour timeframe, failure to do so will result in other qualified technicians providing required service at installer's expense. Subsequent to system acceptance and prior to store turnover to DSG, Vendor #2 will assume all monitoring functions associated with the fire alarm system subject to Vendor #2's acceptance of the system. If system is not acceptable by Vendor #2 by store turnover to DSG, installer will be responsible for providing required monitoring, at no additional cost, until such time that Vendor #2 accepts system. After initial 1 year warranty period vendor #2 will assume responsibility of maintenance of the system.

## 1.08 PRODUCTS

A. This Life Safety System Specification must be conformed to in its entirety to ensure the installed and programmed Life Safety System will accommodate all of the requirements and operations required by the Owner (See Section 00 7100 for definition), DSG and Vendor #2. Any specified item or operational feature not specifically addressed prior to the bid date will be required to be met without exception.

B. General Equipment and Materials Requirements:
   1. All equipment furnished for this project shall be new and unused. All components shall be designed for uninterrupted duty. All equipment, materials, accessories, devices and other facilities covered by this specification or noted on the contract drawings and installation specification shall be best suited for the intended use and shall be provided by a single manufacturer. If any of the equipment provided under this specification is provided by different manufacturers, then that equipment shall be "Listed" as to its compatibility by Underwriters Laboratories (UL), if such compatibility is required by UL standards.

C. Satisfying the Entire Intent of these Specifications:
   1. It is the installer's responsibility to meet the entire intent of these specifications. Deviations from the specified items shall be at the risk of the installer until the date of final acceptance by the architect, engineer, and Vendor #2. All costs for removal, relocation, or replacement of a substituted item shall be at the risk of the installer.

# PART 2 - SPECIFICATIONS

## 2.01 MANUFACTURERS

A. Fire Lite

B. Silent Knight

C. EST

D. Edwards

## 2.02 CONTROL PANEL

A. The fire alarm control panel (FACP) shall be an addressable control panel. The FACP must have a 5 amp power supply (minimum) and be capable of expansion to a maximum of 45 total amps via bus connected expander modules that supervise low battery, loss of AC and loss of communication.

B. The FACP must be capable of supporting a minimum of 127 addressable points and expandable to a minimum of 381 addressable points. This shall be accomplished via two signaling line circuits (SLC) capable of supporting a minimum of 127 devices each. The communication protocol on the SLC loop must be digital.

C. The FACP must support a minimum of six programmable outputs. The panel must have a built in 80 character LCD annunciator with the capability of having an additional eight supervised remote annunciators connected in the field.

D. The FACP must have a built-in UL approved digital communicator. The communicator must allow local and remote up/downloading of system operating options, event history, and detector sensitivity data.

E. The FACP must automatically test the smoke detectors in compliance with NFPA standards to ensure that they are within listed sensitivity parameters and be listed with Underwriters Laboratories for this purpose.

F. The FACP must compensate for the accumulation of contaminants that affect detector sensitivity. The FACP must have a maintenance alert feature (differentiated from trouble condition), auto-programming mode and the ability to upgrade the core operating software on site or over the telephone.

G. The FACP shall have a feature that can automatically enroll all properly connected accessories into a functional system within 60 seconds of powering up the panel. Panels that do not have these capabilities will not be accepted.

H. The main communication bus (RS485) shall be capable of class A or class B configuration with a total Bus length of 6,000 feet.

**2.03 SYSTEM WIRING**

A. The Signaling Line Circuit (SLC) and Data Communication Bus (RS485) shall be wired with standard NEC 760 compliant wiring, no twisted, shielded or mid capacitance wiring is required for standard installations. All FACP screw terminals shall be capable of accepting 14-18 AWG wire. All system wiring shall be in accordance with the requirements of NFPA 70, the National Electrical Code (NEC) and also comply with article 760 of the NEC.

**2.04 SIGNALING LINE CIRCUITS (SLC)**

A. Each SLC shall be capable of a wiring distance of 10,000 feet from the SLC driver module and be capable of supporting 127 devices. The communication protocol to SLC devices must be digital. Any SLC loop device, which goes into alarm, must interrupt the polling cycle for priority response from the FACP. The FACP must respond consistently to a device that goes into alarm on an SLC in under 3 seconds. The auxiliary SLC loop module must be capable of being located up to 6000 feet from the FACP on an RS-485 bus, which is separate from the SLC bus. The SLC shall be capable of functioning in a class A or class B configuration.

**2.05 SLC LOOP DEVICES**

A. Devices supported must include analog photoelectric smoke detectors, ionization smoke detectors, analog heat detectors, addressable input modules, relay output modules or addressable notification modules. There is to be no limit to the number of any particular device type up to the maximum of 127 that can be connected to the SLC.

**2.06 ANALOG DETECTOR FUNCTIONS**

A. The products of combustion detectors must communicate analog values using a digital protocol to the control panel for the following functions:
   1. Automatic compliance with NFPA 72 standards for detector sensitivity testing.
   2. Drift compensation to assure detector is operating correctly.
   3. Maintenance alert when a detector nears the trouble condition.
   4. Trouble alert when a detector is out of tolerance.
   5. Alert control panel of analog values that indicate fire.

**2.07 PROGRAMMABLE OUTPUTS**

A. The FACP shall support six programmable output circuits that are capable of being programmed as supervised reverse polarity notification circuits or supervised auxiliary power circuits that can be programmed as continuous, resettable or door holder power. The circuits shall also be programmable as input circuits in class A or B configurations to support dry contact or compatible two wire smoke detectors.

**2.08 ADDRESSABLE NOTIFICATION MODULE**

A. The General Contractor shall furnish and install where required to meet the intent of the electrical plans, addressable notification modules. The modules shall be U.L. listed compatible with the fire alarm control panel. The notification module must provide one class A (Style Z) or class B (Style Y) notification output with one auxiliary power input. The notification module must be suitable for mounting in a standard 4 square electrical box and must include a plastic cover plate. The notification module must provide an LED that is visible from the outside of the cover plate. The notification module must be fully programmable for such applications as required by the installation. The ANM shall reside on the SLC loop and can be placed up to 10,000ft. from the control or SLC loop module.

**2.09 ANNUNCIATORS**

A. Integral Annunciator - The main control must have a built in annunciator with an 80-character LCD display and feature LED's for General alarm, Supervisory, System trouble, System Silence and Power. When in the normal condition the LCD shall display time and date based on a 200 year clock which is capable of automatic daylight savings time adjustments. All controls and programming keys are silicone mechanical type with tactile and audible feedback. Keys have a

travel of .040 in. No membrane style buttons will be permissible. The annunciator must be able to silence and reset alarms through the use of a keypad entered code, or by using a firefighter's key. The annunciators must have two levels of user codes that will allow the limitation of operating system programming to authorized individuals. NO LOCK OUT CODES SHALL BE PROGRAMMED INTO THE SYSTEM.

B. Remote Annunciators - The fire system shall be capable of supporting up to eight remote annunciators. LCD Remote annunciator shall have the same control and display layout so that they match identically the built in annunciator. Remote annunciators shall be available in two colors, red and light gray. Remote annunciators shall have the same functionality and operation as the built in annunciator. All annunciators must have 80-character LCD displays and must feature five LED's for general alarm, supervisory, system trouble, system silence, and system power. All controls and programming keys are silicone mechanical type with tactical and audible feedback. Keys shall have a travel of .040 inches. No membrane style buttons will be permitted.

C. Either annunciator must be able to silence and reset alarms through the use of a code entered on the annunciator keypad or by using a firefighter key. The annunciator must have a minimum of two levels of user codes that will limit the operating system programming to authorized individuals. The control panel must allow all annunciators to accommodate multiple users input simultaneously. Remote annunciators shall be capable of operating at a distance of 6000 feet from the main control panel on unshielded non-twisted cable.

**2.10 I/O MODULES**

A. The fire system shall be able to support up to eight I/O modules that shall be used to drive remote LED graphic style displays and accommodate up to eight dry contact type switch inputs. The I/O modules shall each drive up to 40 LEDs without requiring external power connections. The I/O module inputs shall be supervised and be suitable for alarm and trouble circuits as well as reset and silence switches.

**2.11 SERIAL/PARALLEL INTERFACE**

A. The fire system shall be capable of supporting up to two serial/parallel interfaces that are capable of driving standard computer style printers. The interface shall be programmable as to what information is sent to it and shall include the ability to print out Detector Status by point, Event History by point and System Programming.

**2.12 DIGITAL COMMUNICATOR**

A. The digital communicator must be an integral part of the control panel, be provided with transient voltage surge suppression (TVSS), and be capable of reporting all zones of alarm, supervisory, and trouble as well as all system status information such as loss of AC, low battery, ground fault, loss of supervision to any remote devices with individual and distinct messages to a central station or remote station (monitoring is to be provided by Vendor #2). The communicator must also be capable of up/downloading of all system programming options, Event history and Sensitivity compliance information to a PC on site or at a remote location.

B. The communicator shall have an answering machine bypass feature that will allow the panel to respond to communication even on phone lines that have other communication equipment present. The communicator must be capable of reporting via Contact ID formats. The communicator shall have a delayed AC loss report function which will provide a programmable report delay plus a 10-25 min random component to help ease traffic to the central station during a power outage. No controls that use External modems for remote programming and diagnostics shall be accepted.

**2.13 DRY CONTACTS**

A. The FACP will have three form "C" dry contacts, one will be dedicated to trouble conditions, the other two will be programmable for alarm, trouble, notification, pre-alarm, waterflow, manual pull, aux. 1 or aux. 2. The trouble contact shall be normal in an electrically energized state so that any total power loss (AC and Backup) will cause a trouble condition. In the event that the Microprocessor on the FACP fails the trouble contacts shall also indicate a trouble condition.

## 2.14 GROUND FAULT DETECTION

A. A ground fault detection circuit, to detect positive and negative grounds on all field wiring. The ground fault detector shall operate the general trouble devices as specified but shall not cause an alarm to be sounded. Ground fault will not interfere with the normal operation, such as alarm, or other trouble conditions.

## 2.15 OVER CURRENT PROTECTION

A. All low voltage circuits will be protected by microprocessor controlled circuit breakers or have a self restoring circuit breaker for the following: smoke detector power, main power supply, indicating appliance circuits, battery standby power and auxiliary output.

## 2.16 TEST FUNCTIONS

A. A “Lamp Test” mode shall be a standard feature of the fire alarm control panel and shall test all LED’s and the LCD display on the main panel and remote annunciators.

B. A “Walk Test” mode shall be a standard feature of the fire alarm control panel. The walk test feature shall function so that each alarm input tested will operate the associated notification appliance for two seconds. The FACP will then automatically perform a reset and confirm normal device operation. The event memory shall contain the information on the point tested. the zone tripped, the zone restore and the individual points return to normal.

C. A “Fire Drill” mode shall allow the manual testing of the fire alarm system notification circuits. The “Fire Drill” shall be capable of being controlled at the main annunciator, remote annunciators and via a remote contact input.

D. A “Bypass Mode” shall allow for any point or nac circuit to be bypassed without effecting the operation of the total fire system.

## 2.17 REMOTE INPUT CAPABILITIES

A. The control panel shall have provisions for supervised switch inputs for the purpose of Alarm reset and Alarm and trouble restore.

## 2.18 NOTIFICATION APPLIANCE MAPPING STRUCTURE

A. All notification circuits and modules shall be programmable via a mapping structure that allows for a maximum of 250 output groups. Each of these groups shall have the ability to be triggered by any of the panels 125 Zones. A zone may trigger from groups individually, or may contain a global trigger for manual pull stations, fire drills and two different system alarms. Additionally each Zone will individually control the cadence pattern of each of the Groups that it is “Mapped” to so that sounders can indicate a variety of conditions. The Zone shall be capable of issuing a different cadence pattern for each of the Groups under its control. The mapping structure must also allow a group to be designated to “ignore cadence” for use with strobes and other continuous input devices. Zones shall have eight different output categories; Detector alarm, Trouble, Supervisory, Pre-alarm, Waterflow, Manual pull, Zone auxiliary one and Zone Auxiliary two. Each of the categories shall have the ability to control from 1 to 8 output groups with a cadence pattern. The patterns are; March code, ANSI 3.41, Single Stroke Bell Temporal, California code, Zone 1 coded, Zone 2 coded, Zone 3 coded, Zone 4 coded, Zone 5 coded, Zone 6 coded, Zone 7 coded, Zone 8 coded, Custom output pattern 1, Custom output pattern 2, Custom output pattern 3, Custom output pattern 4, and Constant. This mapping/cadence pattern shall be supported by all system power supplies and Notification Expander Modules.

## 2.19 ON BOARD PROGRAMMER

A. The FACP shall have an on board programmer which will allow for all system functions and options to be programmed via the on board annunciator keypad. Any panel that does not have this capability will not be accepted.

## 2.20 SERVICE REMINDER

A. The FACP shall be capable of automatically generating textual service reminder and the main and remote annunciator LCD's to inform the user of required testing or service. The service reminder shall not interfere with the normal operation of the FACP.

## 2.21 ENGLISH LANGUAGE DESCRIPTIONS

A. The FACP shall provide the ability to have a text description of each system device, input zone and output group on the system. The use of individual lights to provide descriptions will not be acceptable.

## 2.22 SYSTEM OPERATION

A. Alarm
   1. When a device indicates any alarm condition the control panel must respond within 3 seconds and sound a general alarm to all notification devices. The General Alarm or Supervisory Alarm LED on the annunciators shall light and the LCD should prompt the user as to the number of current events. The alarm information must be stored in event memory for later review. Event memory must be available at the main and all remote annunciators.
   2. Upon actuation of elevator equipment room heat detectors, the FACP shall provide an contact output to actuate the shunt-trip devices associated with the elevator supply circuit breakers (electrical contractor to coordinate).
   3. When the alarmed device is restored to normal, the control panel shall be required to be manually reset to clear the alarm condition, except that the alarms may be silenced as programmed.
   4. An alarm shall be silenced by a code or Firefighter key at the main or remote annunciators. When silenced, this shall not prevent the resounding of subsequent events if another event should occur (subsequent alarm feature). When alarms are silenced the silenced LED on the control panel, and on any remote annunciators shall remain lit, until the alarmed device is returned to normal. Waterflow cannot be silenced until the waterflow switch is returned to its NON alarm state.

## 2.23 TROUBLES

A. When a device indicates a trouble condition, the control panel System Trouble LED should light and the LCD should prompt the user as to the number of current events. The trouble information must be stored in event memory for later review. Event memory must be available at the main and all remote annunciators.

B. When the device in trouble is restored to normal, the control panel shall be automatically reset, The trouble restore information must be stored in event memory for later review. Event memory must be available at the main and all remote annunciators. A trouble shall be silenced by a code or Firefighter key at the main or remote annunciators. When silenced, this shall not prevent the resounding of subsequent events if another event should occur..

## 2.24 SUPERVISION METHODS

A. Each SLC loop shall be electrically supervised for opens and ground faults in the circuit wiring, and shall be so arranged that a fault condition on any loop will not cause an alarm to sound. Additionally, every addressable device connected to the SLC will be supervised and individually identified if in a fault condition. The occurrence of any fault will light a trouble LED and sound the system trouble sounder, but will not interfere with the proper operation of any circuit which does not have a fault condition.

B. Each indicating appliance circuit shall be electrically supervised for opens, grounds and short circuit faults, on the circuit wiring, and shall be so arranged that a fault condition on any indicating appliance circuit or group of circuits will not cause an alarm to sound. The occurrence of any fault will light the trouble LED and sound the system trouble sounder, but will not interfere with the proper operation of any circuit which does not have a fault condition.

## PART 3 - SYSTEM COMPONENTS

### 3.01 CONTROL UNIT

A. System Cabinet:
   1. Mounting: The system cabinet shall be red and surface mounted (as indicated on the electrical plans). The cabinet door shall be easily removable to facilitate installation and service.
   2. Audible System Trouble Sounder: An audible system trouble sounder shall be an integral part of the control unit. Provisions shall also be provided for an optional supervised remote trouble signal.

B. Power Supply and Charger:
   1. The entire system shall operate on 24 VDC, filtered switch mode power supply with the rated current available of 5 Amps (minimum). The FACP must have a battery charging circuit capable of complying with the following requirements:
      a. Twenty-four (24) hours of battery standby with five (5) minutes of alarm signaling at the end of this twenty-four (24) hour period (as required per NFPA 72 central station signaling requirements) using rechargeable batteries with automatic charger to maintain gel-cell batteries in a fully charged condition.
   2. The power supply shall comply with U.L. Standard 864 for power limiting.
   3. The FACP will indicate a trouble condition if there is a loss of AC power or if the batteries are missing or of insufficient capacity to support proper system operation in the event of AC failure. A “Battery Test” will be performed automatically every minute to check the integrity of the batteries. The test must disconnect the batteries from the charging circuit and place a load on the battery to verify the battery condition.
   4. Provide integral transient voltage surge suppression (TVSS) at power supply.
   5. In the event that it is necessary to provide additional power one or more Distributed Power Modules shall be used to accomplish this purpose.

### 3.02 CONNECTIONS AND CIRCUITS

A. Connections to the light and power service shall be on a dedicated branch circuit in accordance with the National Fire Alarm Code NFPA 72, National Electrical Code (NEC) NFPA 70, and the local authority having jurisdiction (AHJ). The circuit and connections shall be mechanically protected. A circuit disconnecting means shall be accessible only to authorized personnel and shall be clearly marked “FIRE ALARM CIRCUIT CONTROL”.

## PART 4 - ACCESSORY COMPONENTS

### 4.01 ACCESSORIES

A. The FACP shall support the following devices on the RS-485 data bus:
   1. Signaling Line Circuit Expander (SLC) Module
   2. Printer Interface Module
   3. LCD Remote Annunciator with reset and silence switches
   4. LED I/O module
   5. IPGSM-4G IP Internet and GSM Dual Path Communicator
      a. IPGSM-4G IP Internet and GSM Dual Path Communicator to be installed where permissible by local municipality. GC to confirm.
      b. IPGSM-4G IP Internet and GSM Dual Path Communicator shall be installed directly to Fire Alarm Control Panel using (1) Data line and (1) dedicated outlet & circuit.
      c. When installing IPGSM-4G IP Internet and GSM Dual Path Communicator, abandon the existing primary phone line for the Fire Alarm system.

### 4.02 DEVICES

A. The FACP shall support the operation of 127 total devices per SLC loop without regard to device type. The following devices shall be supported:
   1. Addressable Analog Photoelectric Smoke detector.
   2. Addressable Analog Heat Sensor
   3. Addressable Relay Module

4. HVAC Duct Detector Enclosure utilizing Addressable Module
5. Addressable Input Module.
6. Addressable Notification Module.
7. Addressable Dual action Manual Pull Station - Key Reset.

B. The FACP shall support these other devices via addressable input, addressable Notification, or Addressable Output Modules.
1. Addressable Dual action Manual Pull Station - Key Reset
2. Combination Horn Strobe or Strobe Only Devices
3. Sprinkler Flow & Tamper Switches; coordinate location and type with fire sprinkler contractor.

**4.03 MANUAL FIRE ALARM STATIONS**

A. Furnish and install devices, as required to provide a complete system. This shall include but is not limited to the following devices:
1. Manual Fire Alarm Stations shall be non-coded, dual-action type, with a key operated test-reset lock in order that they may be tested, and so designed that after actual Emergency Operation, they cannot be restored to normal except by use of a key. The reset key shall be so designed that it will reset Manual station and open FACP without use of another key.
2. An operated station shall automatically condition itself so as to be visually detected, as operated, at a minimum distance of fifty feet, front or side. Manual Stations shall be constructed of die cast metal with clearly visible operating instructions on the front of the stations in raised letters. Stations shall be suitable for surface mounting on matching backbox, or semi-flush mounting on a standard single-gang box, and shall be installed within the limits defined by the Americans with Disabilities Act (ADA) dependent on Manual Station accessibility or per local requirements. Manual Stations shall be installed in conjunction with an Addressable Input Module (AIM) or Mini Input Module (MIM). AIM, MIM, and Manual Stations shall be Underwriters Laboratories listed. Fire Lite BG-12LX, or equal.

**4.04 NOTIFICATION DEVICES**

A. The visible and audible/visible signal devices shall be listed by Underwriters Laboratories Inc. per UL 1971 and/or 1638 for the ST and also UL464 for the HS. Devices shall be mounted as required by locale jurisdictional requirements, at sales floor locations the devices shall be pendant mounted even with the bottom of the sales floor light fixtures. The notification appliance (combination audible/visible units only) shall produce a peak sound output of 88dba or greater as measured in an anechoic chamber. The signaling appliance shall also have the capability to silence the audible signal while leaving the visible signal energized with the use of a single pair of wires. Additionally, the user shall be able to select either continuous or temporal tone output with the temporal signal having the ability to be synchronized. The visible signaling appliance shall maintain a minimum flash rate of 1Hz or greater regardless or power input voltage. The appliance shall also be capable of meeting the candela requirements of the electrical plans presented by the Architect and ADA. Candela output shall be switch adjustable: 15, 15/75, 30, 75, 95, 110, 115, 135, 150, 177, or 185. The appliance shall be polarized to allow for electrical supervision of the system wiring. The unit shall be provided with terminals with barriers for input/output wiring and be able to mount to a single gang or double gang box or double workbox with the use of an adapter plate. The unit shall have an input voltage range of 20-30 volts with either direct current or full wave rectified power. Visual strobe appliances shall be configured such that the flash is synchronized between devices.

**4.05 SMOKE DETECTORS**

A. Smoke detectors shall be ceiling mounted, Analog/Addressable photoelectric smoke detectors. The combination detector head and twist lock base shall be U.L. listed compatible with the fire alarm control panel. The base shall permit direct interchange between ionization smoke detectors or the heat detectors. The base shall be the appropriate twist lock base.

B. The smoke detector shall have a flashing status LED for visual supervision. When the detector is actuated, the flashing LED will latch on steady at full brilliance. The detector may be reset by actuating the control panel's reset switch. The sensitivity of the detector shall be capable of being selected and measured by the control panel without the need for external test equipment. Detectors shall have completely closed back to restrict entry of dust and air turbulence and have a 30 mesh insect screen. Electronics of the unit shall be shielded to protect against false alarms from E.M.I. and R.F.I.

**4.06 HEAT DETECTORS**

A. Furnish and install analog/addressable heat detectors. The combination heat detector and twist lock base shall be U.L. listed compatible with the fire alarm control panel. The base shall permit direct interchange between Ionization smoke detectors and photoelectric smoke detectors. The base shall be appropriate twist lock base. The heat detector shall have a flashing status LED for visual supervision. When the detector is actuated, the flashing LED will latch on steady at full brilliance. The detector may be reset by actuating the control panel's reset switch. Electronics of the unit shall be shielded to protect against false alarms from E.M.I. and R.F.I.

**4.07 DUCT DETECTORS**

A. Furnish and install analog/addressable HVAC duct detectors. Duct Mounted Smoke Detector shall be photoelectric type with auxiliary SPDT relay contact, key-operated NORMAL-RESET-TEST switch, duct sampling tubes extending width of duct, and visual indication of detector actuation, in duct-mounted housing. Detector shall be capable of self monitoring and self adjusting for sensitivity for contaminant build up.

**4.08 TRIP RELAYS**

A. NFPA 90; provide output trip relays to provide shut-down function to HVAC equipment. Coordinate relay requirements with mechanical contractor. Fire Lite CRF300, or equal.

**PART 5 - WIRING**

**5.01 INSTALLER'S RESPONSIBILITIES**

A. The installer shall coordinate the installation of the fire alarm equipment. All conductors and wiring shall be installed according to the manufacturer's recommendations, AHJ and the requirements of Vendor #2. All fire alarm system wiring shall be installed subsequent to all painting - the fire alarm wiring shall NOT be painted or exposed to paint.

B. It shall be the installer's responsibility to coordinate with the supplier, regarding the correct wiring procedures before installing any conduits or conductors.

C. The contractor shall coordinate with Vendor #2 such that subsequent to the installation of the fire alarm system wiring and prior to any further fire alarm system work, Vendor #2 shall inspect, and test, all fire alarm system wiring for acceptance. The contractor shall replace/rework any fire alarm system wiring that is deemed by Vendor #2 to be unacceptable.

**5.02 INSTALLATION OF SYSTEM COMPONENTS**

A. System components shall be installed in accordance with the latest revisions of the appropriate NFPA pamphlets, the requirements contained herein, National Electrical Code, local and state regulations, the requirements of the fire department, other applicable authorities having jurisdiction (AHJ), and Vendor #2.

B. All wire used on the fire alarm system shall be U.L. Listed as fire alarm protection signaling circuit cable per National Electrical Code, Articles 760

**PART 6 - WARRANTY, FINAL TEST AND TURN OVER**

**6.01 GENERAL**

A. Prepare and start systems under direct supervision of the manufacturer's representative and Vendor #2.

B. Include services of manufacturer's technician to supervise installation, adjustments, final connections, and system testing.

C. Coordinate signal requirements by the DACT with Vendor #2. ALL POINTS AND TROUBLES.

D. After Warranty period as per section 1.5, all maintenance will be performed by Vendor #2 subsequent to turn over of the fire alarm system from the contractor to tenant. If the fire alarm system is not accepted by Vendor #2 for maintenance, the contractor shall provide system maintenance at no cost to the tenant until such time it is accepted. All Emergency services will be subject to section 1.5 and will include but not limited to all code/jurisdictional periodic test and inspections until such time Vendor #2 deems the fire alarm system is suitable for acceptance. During the period that the system is deemed unacceptable by vendor #2 all jurisdiction required testing maintenance etc that is preformed shall be documented to tenant and Vendor #2.

**6.02 TESTING**

A. Pre-Final Test
   1. Before the installation shall be considered completed and acceptable by Vendor #2, a test of the system shall be performed as follows (Note: all acceptance tests shall be performed under the direction and to the satisfaction of Vendor #2). This pre-test is intended to ensure system proper system operation prior to having the AHJ witness a system test.
   2. The General Contractor shall operate every building fire alarm device to ensure proper operation and correct annunciation at the control panel.
   3. At least one half of all tests shall be performed on battery standby power.
   4. Where application of heat would destroy any detector, it may be manually activated.
   5. The communication loops and the indicating appliance circuits shall be opened in at least two (2) locations per circuit to check for the presence of correct supervision circuitry.
   6. When the testing has been completed to the satisfaction of Vendor #2, a notarized letter co-signed by the General Contractor and Vendor #2's representative attesting to the satisfactory completion of said testing shall be forwarded to DSG and included in final close out documents .
   7. The General Contractor shall leave the fire alarm system in proper working order for acceptance by Vendor #2.

B. Final Test for Witness by AHJ - Before the installation shall be considered completed and acceptable by the AHJ, a test of the system shall be performed as follows:
   1. The General Contractor shall operate every building fire alarm device to ensure proper operation and correct annunciation at the control panel.
   2. At least one half of all tests shall be performed on battery standby power.
   3. Where application of heat would destroy any detector, it may be manually activated.
   4. The communication loops and the indicating appliance circuits shall be opened in at least two (2) locations per circuit to check for the presence of correct supervision circuitry.
   5. When the testing has been completed to the satisfaction the AHJ, a notarized letter cosigned by the General Contractor attesting to the satisfactory completion of said testing shall be forwarded to tenant and Vendor #2 and shall be included as part of final Closeout documents per 6.03.
   6. The General Contractor shall leave the fire alarm system in proper working order for acceptance by the AHJ.
   7. Prior to final test the local fire marshal must be notified in accordance with local requirements.

**6.03 CONTRACT CLOSE-OUT SUBMITTALS**

A. Submittals shall comply with section 01 3000 and shall also include deliver of two copies of the final close out documents after Vendor #2 acceptance - one copy to Vendor #2 and one to DSG within Thirty (30) days of system acceptance. The closeout submittals shall include but not limited to:
   1. Installation and Programming manuals for the installed Life Safety System.

2. Point to point diagrams of the entire Life Safety System as installed with programmed device addresses. This shall include all connected Smoke Detectors and addressable field modules.
3. All drawings must reflect device address.
4. A copy of the manufacturer warranty.
5. A list of all inspection, testing or Maintenance required for the system by local jurisdictional authorities.

B. Operating and Instruction Manuals - Operating and instruction manuals shall be submitted prior to testing of the system. Six (6) complete sets of operating and instruction manuals shall be delivered to the Architect upon completion. User operating instructions shall be provided prominently displayed on a separate sheet located next to the control unit in accordance with U.L. Standard 864.

## PART 7 - ACCEPTANCE BY VENDOR #2

### 7.01 HORIZONTAL WIRE RUN INSPECTION

A. Inspect horizontal wire runs for both intrusion and fire alarm systems.
1. Check for use of beam clamps and bridal rings.
2. Check that wire is not tied to metal structure in any location.
3. Check that cable ties are not pulled to tight and pinching cable packs.
4. Check all pass through areas walls or floors for properly sleeved and bushings used.
5. Check to see if cable has been painted (if ceiling is already painted).
6. Check turns for soft turns, and that cable is not pulled against sharp corners.
7. Check all J-boxes for box bushings or Romex connectors to protect cable entrance and exit.
8. Check that no cables are running parallel to high voltage cable, and if they must be run parallel check for 4 inch minimum spacing between high voltage and security cables.
9. Test for shorts and grounds on all cables installed.

### 7.02 THROUGH WALL WIRE INSPECTION

A. Inspect all cables running through walls without conduit prior to gypsum board installation:
1. Inspect all cable running through walls but not protected by conduit for plastic bushings installed in the steel studs to protect cable from sharp edges.
2. Check that no cable is tied in the wall to any metal object.
3. Check that no cable is running in wall with high voltage 4 inch minimum separation.
4. Check all J-boxes for either box bushings or Romex connectors to protect cable entrance and exit.
5. Test all cables for shorts or grounds.

### 7.03 VERTICAL WIRE RUN INSPECTION

A. Check all vertical cable runs:
1. Check that all cables in conduit for a maximum conduit fill ratio of 43%.
2. Check conduit run for maximum of 360 degree in total bends without J-Box installed.
3. Check cable entrance into conduit for bushing to protect cable from chafing.
4. Check all flexible conduits proper connectors to J-box and device connection.
5. Check raceway through window or door mullions for flexible conduit to protect from sharp edges of aluminum frame work and glass resting on cable.
6. Check all cables for shorts or grounds.

### 7.04 GENERAL NOTES:

A. Contract with Vendor #2 should be complete prior to start of construction.

B. Any cables that fail test or inspection will be replaced and not repaired.

C. Electrical Subcontractor will coordinate with Vendor #2's Project Manger to schedule inspections (72 HRS minimum lead time).

D. Any inspections scheduled and work not completed may result in additional charges.

E. Any inspections scheduled and work not completed may result in additional charges.

F. Work not completed before any inspections scheduled may result in additional charges.

G. Lifts for inspection will be provided by electrical subcontractor.

H. A representative of Electrical Subcontractor shall be present during inspection and testing

I. Electrical Subcontractor will provide Vendor#2 a copy of as-built drawings showing cable runs (2 ) two copies separate from General Contractor close out requirements..

**END OF SECTION**

**SECTION 28 5747**

**AUDIO / VISUAL SYSTEM**

## PART 1 - GENERAL

### 1.01 AUDIO / VISUAL EQUIPMENT

A. The General Contractor on BTS projects will contract with Vendor 5 and Vendor 13 to furnish and install Audio / Visual Equipment.

B. The General Contractor on RBTS projects will coordinate installation of DSG provide Audio / Visual Equipment furnished and installed by DSG's Vendors 5 and 13.

C. Contractor shall provide all electrical components and work required for the audio-visual equipment installation. Coordinate scope of work with Vendor 5 and Vendor 13.

### 1.02 SUBMITTALS

A. Prior to fabrication, submit to the AOR for review the following:
   1. Submit rough-in drawings for equipment showing dimensioned locations, size and height.
   2. Submit the manufacturer's product data for manufactured equipment showing components, functions, operations, finishes, service connections, characteristics, and wiring diagrams for control systems.
   3. Carefully measure the locations of all floor and wall penetrations and existing conditions, and indicate them and provide for them on shop drawings and project record documents.
   4. Indicate exact sizes and locations of necessary blocking.

### 1.03 OPERATION AND MAINTENANCE DATA

A. At completion of the work, provide a qualified and trained manufacturer's representative to demonstrate the operation of each item of equipment and instruct DSG personnel in the operating procedure and maintenance.

### 1.04 DELIVERY, STORAGE AND HANDLING

A. General Contractor is responsible for securely storing materials to prevent damage and theft. Strictly adhere to manufacturer's instructions.

### 1.05 ENVIRONMENTAL REQUIREMENTS

A. Maintain room temperature at 65 degrees Fahrenheit for 72 hours before equipment installation begins and continuous during and after installation.

## PART 2 - PRODUCTS

### 2.01 VENDOR SCOPE

A. Vendor 13 provides and installs all speaker cable, coax cable and data cable for the audio / visual systems.

B. Vendor 5 provides and installs the following equipment:
   1. Televisions and mounting hardware including poles.
   2. A/V equipment cabinet and rack
   3. Media Players
   4. Monitors.
   5. Speakers.

## PART 3 - EXECUTION

### 3.01 EXAMINATION

A. Prior to equipment installation, verify all ventilation outlets, utility and electrical service connections, and instructions to all parties with regard to shop drawings.

### 3.02 FIELD DIMENSIONS

A. Before installation, check building dimensions and service rough-in, including means of access, for conditions affecting delivery and installation of equipment.

### 3.03 INSTALLATION

A. Coordinate installation of Vendor 5's equipment.

B. Coordinate installation of Vendor 13's cabling.

C. Provide inserts, and anchors built into other work for support of this work. Ensure that these items are installed in their proper location. Include fastening devices required to attach the work. Use proper anchoring devices for the materials encountered and the usage expected.

D. Install items in accordance with the manufacturers' instructions using workers skilled and familiar with items and installation requirements.

E. Shop assemble work where possible and test at shop.

F. Sequence installation and erection to ensure electrical connections are effected in an orderly and expeditious manner.

G. Do cutting, fitting and patching necessary, coordinating the work fully with other trades.

H. Cut and drill tops, backs and other elements as required for service outlets and fixtures. Install fixtures and fittings supplied under this section. Have connections to services made by appropriate trades under Division 16.

### 3.04 DEMONSTRATION AND TESTING

A. Test, clean and adjust equipment prior to demonstrations to ensure that correct services have been provided and that equipment is operational and complete in all respects, including specified accessories.

B. Prior to a demonstration, submit three (3) ring binders of operating and maintenance manuals.

C. Make arrangements for demonstration a minimum of two (2) weeks in advance, and coordinate with DSG.

D. Provide a written report of demonstration to the DSG Construction Project Manager outlining the equipment demonstrated and malfunctions or deficiencies noted. Indicate individuals present at demonstration.

### 3.05 ADJUSTING AND CLEANING

A. Test, clean and adjust equipment and apparatus to ensure proper working order conditions.

**END OF SECTION**

# Vendor Matrix

## 1066 - Greenville, NC

*Fiscal Year* *24*
Issued 2/27/2024

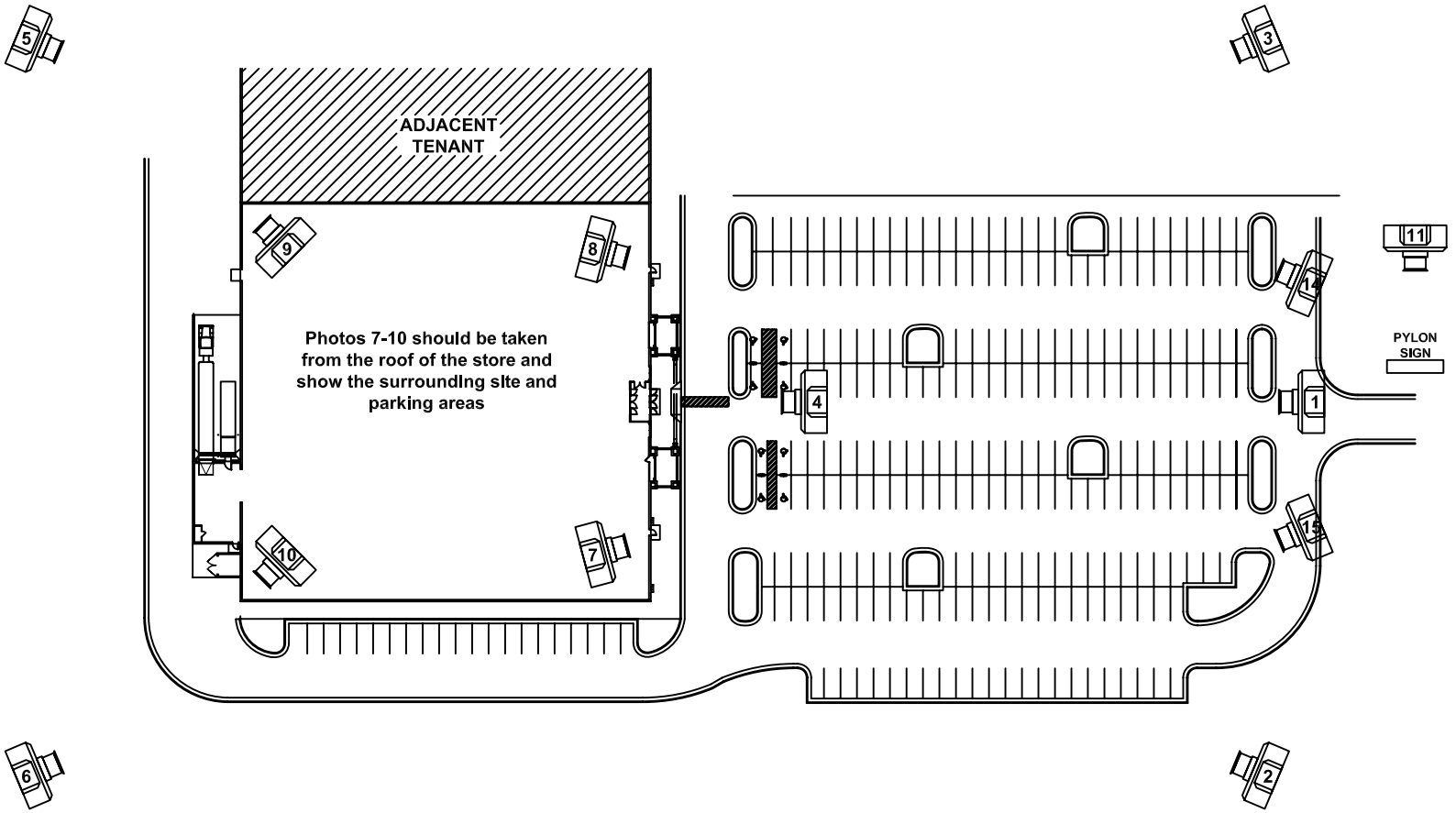
## FW Remodel RBTS Single Level

| Vendor | Scope of Work | Lead Time in Wks: | Purchased By | Installed By | Vendor Primary Contact: |
|---|---|---|---|---|---|
| 01 - Advanced Fixtures Inc. | Casework/Millwork, Slatwall/Plas. Lam. Panels/MDF Panels, Wall Lozier | 10 | * | Vendor | DSG - Heather Ingram, 972-784-8800 x 225, dickspjm@advancedfixtures.com |
| 02 - JCI / BA | Security | 4 | * | Vendor | DSG Support Team / Riley Vanbrocklin, 708.710.5605, bts-dsgsupport@jci.com / riley.vanbrocklin@jci.com |
| 03 - Real Floors Commercial, Inc. | All Flooring Materials / Ceramic Tile / Wall Carpet | 6 | * | Vendor | Zac Brock, 770-405-3350 x 1511, zbrock@rfcommercial.com |
| 04 - Cook & Boardman Group | Hollow Metal Doors (Frames & Hardware, Cores, Keying), Fitting Room Doors | 6 | * | G.C. | Lisa Steines, 855-447-8600, ext. 4517, dsg@cookandboardman.com |
| 08 - ImageOne | Graphics, artwork, wall covering, overhead displays | 15 | * | Vendor | A.J. Rocchio, (215) 826-0880 x1150, arocchio@l1ind.com |
| 13 - Level 10 | Data / Telephone Wiring, Paging System / Traf-Sys, Speakers | 2 | * | Vendor | DSG Mailbox, 847-805-9055, dsg@level10.com |
| 15 - Retail Fixture Solutions, Inc | Backroom Shelving (including Conveyor System to Mezzanine when required), Dock Levelers / Dock Seals | 10 | * | Vendor | Kevin Hoffman, 972-923-0001 x 103, estimating@retailfixturesolutions.com |
| 18 - Rexel Capitol Light | Switchgear, Lighting Fixtures | 6 | * | G.C. | Don Barr, 614-771-7366, don.barr@capitollight.com |
| 19 - JCI / Sensormatic | CCTV, EAS | 8 | * | Vendor | Quotes: Matthew.Meade@jci.com (917-806-5838). Scheduling: Charles.Roberson@jci.com (561-341-7699) |

* When project is BTS, scope is purchased by Developer through GC; when RBTS, scope is purchased through DSG

***Please note: Lead Time is prototypical and may vary under current market conditions. Verify with vendors when project is awarded.***

***The information contained herein supercedes any information that may have been issued prior to this date and is subject to change.***




NOTES:

11 SHOULD SHOW SIGNAGE/PYLON VISIBLE FROM MAIN POINT OF ENTRANCE.

12 SHOULD SHOW DSG VISIBILITY FROM INTERSTATE OR HIGHWAY IF APPLICABLE.

13 SHOULD SHOW ALL WAYFINDING / DIRECTIONAL SIGNAGE BOTH INTERIOR AND EXTERIOR IF APPLICABLE.

14 15 SHOULD SHOW DSG AND ADJACENT IN-LINE TENANTS TO THE RIGHT AND LEFT SIDES.

The General Contractor is required to take the following digital photographs and send to the (DSG) Dlck's Sportlng Goods Project Manager and Senlor Project Manager where the photos are received no later than 12:00 PM on the Friday preceding Soft Opening. Please coordinate time of photos with DSG Project Manager

DICK'S Sporting Goods
STORE #XXX

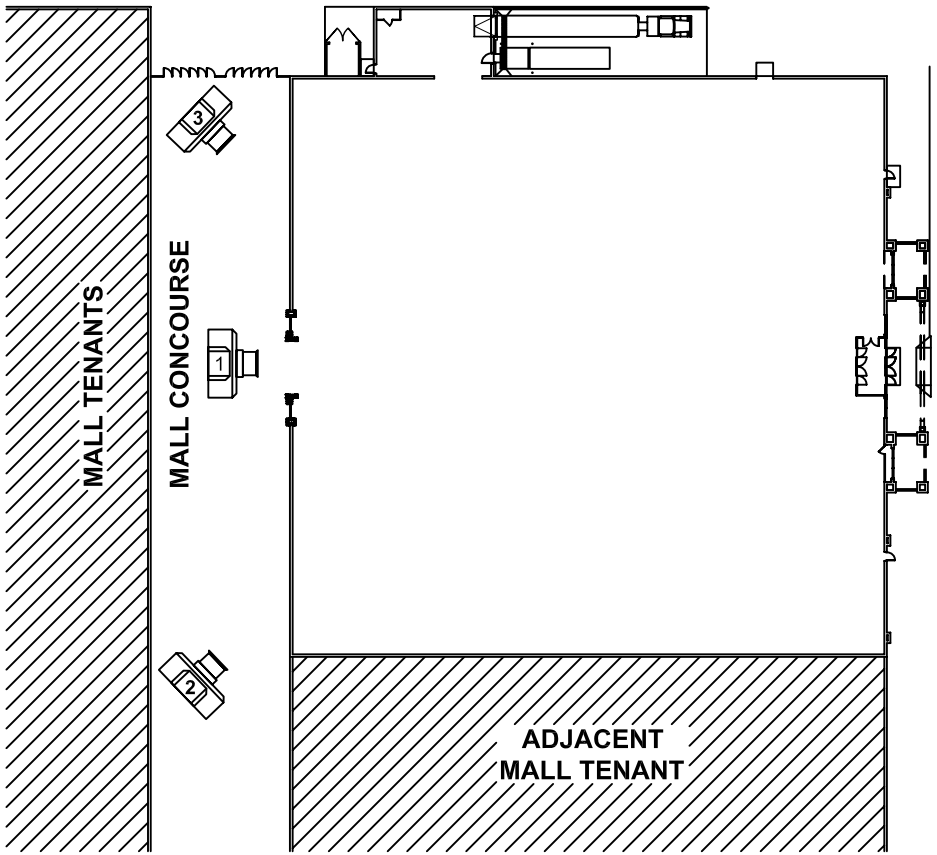
Maxwell Johanson Maher
architects
105 Broadway Avenue
Nashville, Tennessee 37201
ph. 615-244-8770
fax 615-244-8844
www.mjmarch.com

EXHIBIT B-1
PROJECT CLOSEOUT - PHOTOS REQUIRED

JOB NO. XXXXX
SCALE: N.T.S.
DATE: XXXXX

SHEET NO.

B-1




**NOTES:**

1 **STRAIGHT-ON VIEW OF MALL ENTRANCE.**

2 3 **SHOULD SHOW OVERALL VIEWS OF ENTIRE DKS BRANDED WALL ALONG MALL CONCOURSE.**

**The General Contractor is required to take the following digital photographs and send to the (DSG) Dick's Sporting Goods Project Manager and Senior Project Manager where the photos are received no later than 12:00 PM on the Friday preceding Soft Opening. Please coordinate time of photos with DSG Project Manager**

DICK'S Sporting Goods
STORE #XXX

Maxwell Johnson Maher
architects
105 Broadway Avenue
Nashville, Tennessee 37201
www.mjmarch.com
ph. 615-244-8770
fax 615-244-8841
mjm@mjmarch.com

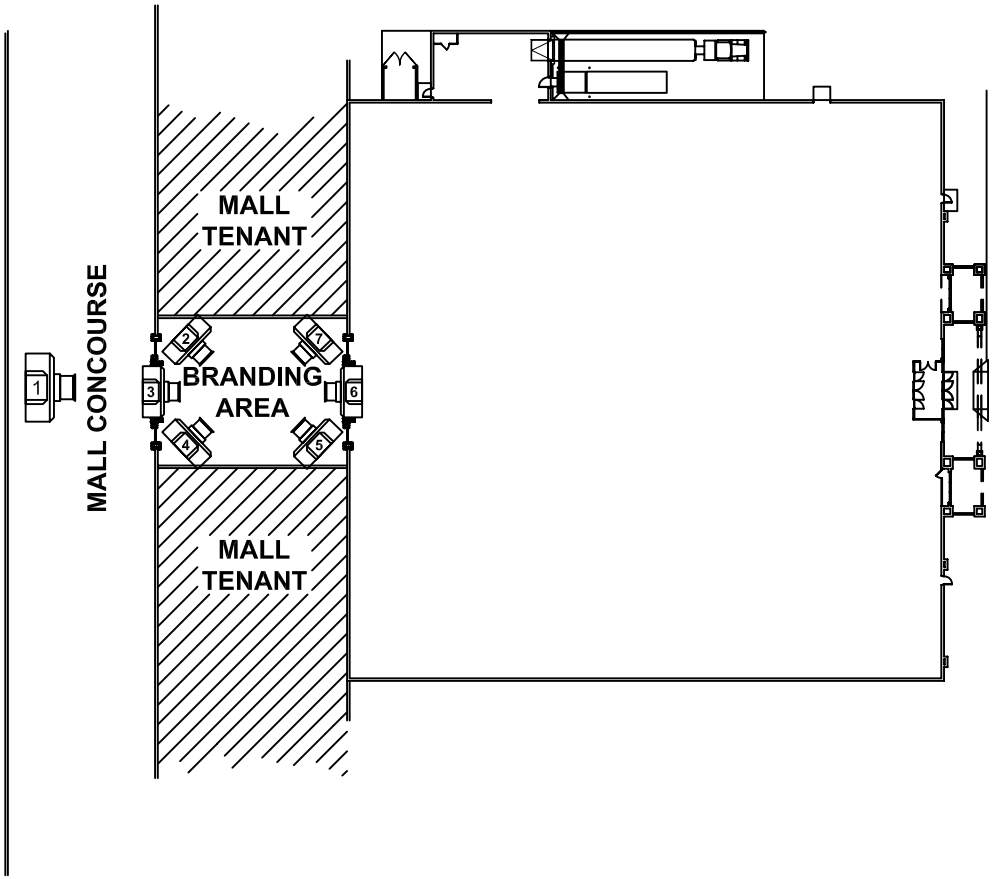
# EXHIBIT B-2

BRANDED WALL AT MALL
PROJECT CLOSEOUT -
PHOTOS REQUIRED

| JOB NO. | SCALE: | DATE: |
|---|---|---|
| XXXXX | N.T.S. | XXXXX |

SHEET NO.

B-2




**NOTES:**

1 **STRAIGHT-ON VIEW OF MALL ENTRANCE.**

**The General Contractor is required to take the following digital photographs and send to the (DSG) Dick's Sporting Goods Project Manager and Senior Project Manager where the photos are received no later than 12:00 PM on the Friday preceding Soft Opening. Please coordinate time of photos with DSG Project Manager**

DICK'S Sporting Goods
STORE #XXX

Maxwell Johanson Maher architects
105 Broadway Avenue
Nashville, Tennessee 37201
www.mjmarch.com
ph. 615-244-8770
fax 615-244-8844
mjm@mjmarch.com

EXHIBIT B-3
BRANDING AREA
PROJECT CLOSEOUT - PHOTOS REQUIRED

| JOB NO. | SCALE: | DATE: |
|---|---|---|
| XXXXX | N.T.S. | XXXXX |

SHEET NO.

B-3

## LANDLORD / GENERAL CONTRACTOR CLOSEOUT DOCUMENTS CHECKLIST

| | |
|---|---|
| **Store name, number and type (BTS or RBTS) :** | |
| **Construction Completion date:** | **Soft Open date:** |
| **General Contractor:** | **Construction PM:** |
| **Landlord:** | **Facilities Manager:** |

1.) All items below should be saved separately on a **REWRITABLE** disc (2 disc copies required) A sample disc organization is attached to this checklist.
2.) Two copies of the disk should be submitted to the DSG corporate office.
3.) One full size hard copy of a complete set of (including Sprinkler and Fire Alarm) as-builts must be place in electrical room tube at the store.
4.) Extra hard copies of manuals are to be sent or left at the store.
5.) Only submit to DSG PM the items that are listed on this checklist. National vendor warranties and manuals are on file at the corporate office.
6.) This checklist and close out documents must be received by the DSG PM 60 days from the date of lease turnover date.
7.) All items must be completed, submitted and corrected before final payment will be released.

- [ ] **Final, completed punchlist signed off by the store manager**
- [ ] **Certificate of Completion**
- [ ] **Building Permit (copy)**
- [ ] **FINAL Certificate of Occupancy (copy)**
- [ ] **Project Directory - Includes all subcontractors (and NAVs), trade, address, phone number and contact name**
- [ ] **Sales tax statement (A template is attached to this checklist for completion)**
- [ ] **Architect statement that all submittal requirements have been completed/approved (This must be obtained by the GC/LL)**
- [ ] **Final Test & Balance Report**
- [ ] **Start up/deficiency report from Lennox (all deficiencies must be addressed prior to submittal)**
- [ ] **Cal-Green Commissioning report (if applicable)**
- [ ] **Programming/deficiency report from Novar (all deficiencies must be addressed prior to submittal)**
- [ ] **Tyco acceptance letter for Fire Alarm System with date of turnover noted (only needed if installed by EC)**
- [ ] **One hard copy of a complete set of (including Sprinkler and Fire Alarm) as-builts placed in tube at store electrical room**
- [ ] **Attic stock left in manager approved space at store (submit photo of material left at store)**
  - One clearly labeled quart of each type of paint used (P-color and texture)
  - One sealed box of each type of floor covering
  - One sealed box of ceiling tile
  - Five track heads
- [ ] **Final, completed ADA Punchlist with corrections signed off by store manager and completion photos included in pdf format.**

### WARRANTIES (non-national accts)

- [ ] **General Contractor**
- [ ] **Site work**
- [ ] **Concrete**
- [ ] **Mason**
- [ ] **Steel Erector**
- [ ] **Misc Metal**
- [ ] **Carpenter**
- [ ] **Caulker**
- [ ] **Roofer 2 year labor**
- [ ] **Roofing Manufacturer's warranty (main roof)**
- [ ] **Roofing Manufacturer's warranty (metal roof)**
- [ ] **Metal roof - 2 year weather tightness warranty**
- [ ] **Framer**
- [ ] **Drywaller**
- [ ] **Storefront (glazer)**
- [ ] **Acoustic Ceiling**
- [ ] **Painter**
- [ ] **HVAC**
- [ ] **Plumber**
- [ ] **Fire Protection**
- [ ] **Electrician**
  **(includes FA if installed by EC)**
- [ ] **Elevator /Escalator**
- [ ] **EIFS**

### OWNER'S MANUALS

- [ ] **HVAC Systems**
- [ ] **Fire Protection**
- [ ] **Security Grilles and Shutters**

### OTHER WARRANTIES (if applicable)

- [ ] **Soil Treatment - 5 year**
- [ ] **Glazing Manufacturer - 10 year**
- [ ] **EIFS Manufacturer - 12 year**
- [ ] **Sealant - 5 year**
- [ ] **Shingle Manufacturer**
- [ ]
- [ ]
- [ ]
- [ ]

GC Project Manager Signature

Date of submission to DSG PM

DSG Construction Manager Signature

Date of acceptance and submittal to Facilities Mgr

DSG Facilities Manager Signature

Date of acceptance

updated 11.13.14

EVERY SEASON STARTS AT DICK'S SPORTING GOODS

# WEEKLY CONSTRUCTION REPORT

**ATTN:**
**FAX:** Email:

## SITE INFORMATION

Report Date: Delivery / Turn Over: Punch Date:
Completed By: **Is schedule being met?**
( 7 to 14 days before turnover)
Store #:
if answer is no, please explain in comments at end
Official Address:

Developer: Phone #:
Contact: Phone #:
Contractor: Phone #:
Contact: Phone #:

| EXTERIOR | % | Comp Date: | SHELL | % | Comp Date: |
|---|---|---|---|---|---|
| Site Work | | | Foundations | | |
| Block | | | Steel Ordered? | | |
| Brick veneer | | | Bldg Steel | | |
| EIFS | | | Mezz Steel | | |
| Paving & Striping | | | Mezz concrete | | |
| Lighting | | | Decking | | |
| Image one | | | Roofing | | |
| RTUS | | | Landscaping | | |

**DATE OF EXPECTED OFF SITE UTILITIES**
provide this information even if it is not in your scope

| | % | Comp Date: |
|---|---|---|
| Electric: | | |
| Gas: | | |
| Phone: | | |
| Water: | | |
| Sewer: | | |

| INTERIORS | % | Comp Date: | INTERIORS | % | Comp Date: |
|---|---|---|---|---|---|
| UG Plumbing | | | Drywall | | |
| UG Electrical | | | Painting | | |
| Concrete | | | Flooring | | |
| Plumbing RI | | | ADT | | |
| Electrical RI | | | Sensormatic | | |
| Perm. Power date | | | Image One | | |
| HVAC | | | Novar program | | |
| Fire Protection | | | Millwork | | |
| Framing | | | Final Cleaning | | |

| | Complete |
|---|---|
| Backboards installed for phone equipment, FA, etc | |
| Thru wall conduit for MDF & IDF | |

## NATIONAL ACCOUNTS CONTRACT/PO UPDATE

| VENDOR | DATE ORDERED | CONTRACT EXECUTION DATE | PO/CONTRACT# | SCHEDULED DELIVERY&COMPLETION |
|---|---|---|---|---|
| Milwork & Shelving | | | | |
| ADT - Burglar Alarm | | | | |
| Flooring | | | | |
| Girtman Associates | | | | |
| Ovation In-Store | | | | |
| PTR Baler | | | | |
| Image One (exterior signage) | | | | |
| Image One (interior graphics) | | | | |
| Core Marketing (storefront) | | | | |
| Lennox | | | | |
| Source One | | | | |
| HyTek (1-level stores) | | | | |
| Capitol Light/Rexel | | | | |
| Sensormatic | | | | |
| Stanley Doors | | | | |
| Cornell Dock Doors | | | | |
| Symmetry (2-level stores) | | | | |
| Material Handling Products | | | | |
| Premier Store Fixtures | | | | |
| GTC - Painted Graphic | | | | |
| Sanico Company | | | | |
| Schindler Elevator Corp (2 level stores) | | | | |
| Interior Signs (spec-10440) | | | | |

## CHANGE ORDER LOG AND TRACKING

| Change Order # | Date | Amount | Description and status |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | Total | | |

**GENERAL UPDATE: (provide brief summary of events happening this week onsite)**

EVERY SEASON STARTS AT DICK'S SPORTING GOODS

# UTILITY REQUEST FORM

Store Number: _____

Store Permanent Address: _____

_____

Phone # : _____

If Existing Structure:

Existing Meter numbers: _____

Former Tenants Name: _____ Phone: _____

IF NEW CONSTRUCTION:

Name of Construction Company: _____

Phone #: _____

Contact: _____

CHECK ONE: ☐ Lease Property Manager Contact: _____

Phone: _____

☐ Own

☐ Other

**Electric Company:** _____

Phone #: _____

Meter Number: (provide photo of meter in place and close up of meter number) _____

Account #: _____

**Gas Company:** _____

Phone #: _____

Meter Number: (provide photo of meter in place and close up of meter number) _____

Account #: _____

**Water Company:** _____

Phone #: _____

Meter Number: (provide photo of meter in place and close up of meter number) _____

Account #: _____

**Sewage Company:** _____

Phone #: _____

Meter Number: (provide photo of meter in place and close up of meter number) _____

Account #: _____

Date Utility Accounts to be Opened by: _____

# Certificate of Completion

PROJECT:
(Name and address)

CONTRACT:

CONTRACT DATE:

CONTRACTOR:

The work performed under the Contract by the Contractor has been reviewed by the Contractor and found to have been completed in strict accordance with the Architect's plans and in accordance with the Contract. The Contractor agrees to indemnify, defend and hold Dick's Sporting Goods, Inc. harmless against any expense, loss or claim as a result of the work performed by the Contractor failing to be completed in strict accordance with the Architect's plans and in accordance with the Contract. In addition, the Contractor shall repair or replace at its sole expense any work that was not completed in strict accordance with the Architect's plans and the Contract.

**CONTRACTOR**
By: _____
Name: _____
Title: _____