

# **Walmart**

UNISPEC - REMODEL

**Massa Multimedia Architecture**  
**Studio B – 3297 Route 66**  
**Neptune, NJ 07753**  
**(732) 918-2300**



PROJECT MANUAL

**WALMART SUPERCENTER REMODEL  
CAMERON, NC  
Store Number: 06958**

**Project Number: 194-23-047**

**01/08/2025**

For  
**WALMART STORES, INC.  
REMODEL**  
702 SW 8th St.  
Bentonville, Arkansas 72716

UniSpec - Remodel

010106

DOCUMENT 00007 - SEALS PAGE

ARCHITECT OF RECORD

Architect of Record  
*Gabriel J. Massa, AIA, RA, NCARB*  
*Massa Multimedia Architecture, PC*  
*3297 Route 66*  
*Neptune, New Jersey 07753*



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Architect of Record

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Date

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#06958 Cameron, NC

01/08/2025

UniSpec - Remodel

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CIVIL ENGINEERING CONSULTANT OF RECORD

Atwell LLC

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James A. Lowe  
Civil Engineering Consultant of Record

12-18-2024  
Date

00007-1

SEALS PAGE (Continued)

STRUCTURAL ENGINEER OF RECORD

Brian Makovec, P.E.  
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Kansas City, Missouri 64105  
NC COA #P-0672



*Brian Makovec* 12/12/24  
\_\_\_\_\_  
Structural Engineer of Record                      Date

SEALS PAGE

ELECTRICAL ENGINEER OF RECORD

Eric S. Kesterson  
240 W 37th St, Suite 304  
New York, NY 10018



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Electrical Engineer of Record

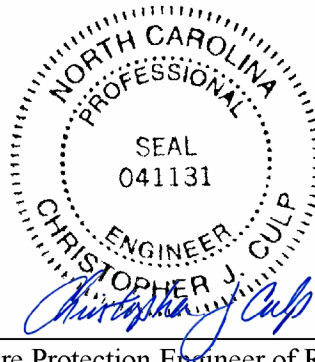
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Date

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FIRE PROTECTION ENGINEER OF RECORD

Christopher J. Culp  
240 W 37th St, Suite 304  
New York, NY 10018



\_\_\_\_\_  
Fire Protection Engineer of Record

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\_\_\_\_\_  
Date

SEALS PAGE

MECHANICAL ENGINEER OF RECORD

Jarrold M. Easterwood  
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\_\_\_\_\_  
Mechanical Engineer of Record

01/07/2025  
\_\_\_\_\_  
Date



END OF DOCUMENT

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SECTION 00010 - TABLE OF CONTENTS

INTRODUCTORY INFORMATION

00001 Project Title Page  
 00007 Seals Page  
 00010 Table of Contents

BIDDING REQUIREMENTS

Bidding Requirements (including Invitation to Bids, Instructions to Bidders, and Bid Forms) may be obtained through the Owner’s online Bidding System and are not included in the Project Manual.

CONTRACTING REQUIREMENTS

Contracting Requirements (including Construction Contract Between Owner and Contractor, Bond, and Certificate Forms) are issued by the Owner (Walmart) under separate cover and are not included in the Project Manual.

**DIVISION 1 - GENERAL REQUIREMENTS**

01100 Summary  
 01131 Alterations Project Procedures  
 01230 Alternates  
 01255 Request for Information  
 01310 Construction Management and Coordination  
 01311 Project Meetings  
 01312 Progress Meetings  
 01320 Construction Progress Documentation  
 01330 Submittal Procedures  
 01351 Regulatory Compliance  
 01452 Contractor’s Quality Control  
 01454 Architect-Engineer Quality Assurance  
 01455 Mechanical Equipment Testing, Adjusting, and Balancing  
 01457 Testing and Inspection by Owner  
 01500 Temporary Facilities and Controls  
 01550 Tension Pole Dust Barrier Systems  
 01600 Product Requirements  
 01700 Execution Requirements  
 01731 Cutting and Patching  
 01740 Cleaning  
 01770 Contract Closeout

**DIVISION 2 - SITE CONSTRUCTION**

02251 Shoring  
 02320 Excavating, Backfilling and Compacting

**DIVISION 2.1 - CIVIL SITE CONSTRUCTION (By Civil Engineer of Record)**

The Sections within this Division and other Divisions listed within the Sitework Specifications Table of Contents page are the responsibility of the Civil Engineer. The Engineering Consultant, the seal and license number of the Professional Engineer registered in the State where the project is located, are also shown on the Sitework Specifications Table of Contents page.

**DIVISION 3 - CONCRETE**

03310 Structural Concrete and Exterior Concrete Slabs

03314 Cast-in-place Concrete Slabs (Interior)  
03366 PVC/VCT Removal and Polished Concrete Floor Finishes for Interior Slabs  
03531 Architectural Concrete Overlayment  
03905 Interior Concrete Slab Repairs and Joint Filler Replacement  
03931 Interior Concrete Slab Surface Enhancement

**DIVISION 4 - MASONRY**

04200 Unit Masonry Assemblies  
04910 Masonry Restoration and Repair

**DIVISION 5 - METALS**

05090 Concrete and Masonry Anchors  
05120 Structural Steel  
05210 Steel Joists  
05300 Metal Deck  
05400 Cold Formed Metal Framing  
05500 Metal Fabrications

**DIVISION 6 - WOOD AND PLASTICS**

06065 Plastic Materials  
06100 Rough Carpentry  
06165 Fiberboard Panels  
06200 Finish Carpentry  
06400 Architectural Woodwork and Millwork Assemblies  
06424 Protective Surfacing  
06610 Glass Fiber Reinforced Plastic

**DIVISION 7 - THERMAL AND MOISTURE PROTECTION**

07210 Building Insulation  
07240 Exterior Insulation and Finish Systems (EIFS)  
07243 Water-Drainage Exterior Insulation and Finish System (EIFS)

07530 Elastomeric Membrane Roofing

07620 Sheet Metal Flashing and Trim  
07710 Manufactured Roof Specialties  
07711 Gutters and Downspouts  
07721 Manufactured Curbs  
07840 Firestopping  
07900 Joint Sealers

**DIVISION 8 - DOORS AND WINDOWS**

08110 Steel Doors and Frames  
08150 Recycled Plastic Interior Man Doors  
08305 Side Folding Grille  
08311 Access Doors and Frames

08383 Traffic Doors

08462 Automatic Sliding Entrance Doors  
08710 Door Hardware  
08800 Glazing  
08845 Glass Film Finishes

**DIVISION 9 - FINISHES**

09250	Gypsum Board
09310	Ceramic Tile
09511	Acoustical Panel Ceilings
09650	Resilient Flooring
09655	Resilient Base and Accessories
09656	Recycled Rubber Commercial Flooring
09680	Carpet
09720	Composite Decorative Faux Tile Wall Panels
09777	Vinyl Graphic Film Wrap
09900	Paints and Coatings

**DIVISION 10 - SPECIALTIES**

10146	Exterior Signage
10160	Metal Toilet Compartments
10260	Wall and Corner Guards
10736	Metal Canopy
10810	Toilet Accessories

**DIVISION 11 - EQUIPMENT**

11141	Oil and Filter Waste Containment Devices
11400	Food Service Equipment

**DIVISION 12 - FURNISHINGS**

NOT APPLICABLE

**DIVISION 13 - SPECIAL CONSTRUCTION**

13030	Modular Building Components
13080	Seismic Protection for Mechanical, Electrical, and Refrigeration
13300	Vertical Barrier Net System
13810	Building Automation System (BAS)

**DIVISION 13.1 - FIRE PROTECTION (By Fire Protection Engineer of Record)**

The Sections within this Division are the responsibility of the Fire Protection Engineer. The Engineering Consultant, the seal and license number of the Professional Engineer registered in the State where the project is located, are also shown on the Seals Page.

13900	Fire Suppression
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**DIVISION 14 - CONVEYING SYSTEMS**

14580	Pneumatic Tube System
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**DIVISION 15 - MECHANICAL (By M.E.P. Engineer of Record)**

The Sections within this Division are the responsibility of the Mechanical Engineer. The Engineering Consultant, the seal and license number of the Professional Engineer registered in the State where the project is located, are also shown on the Seals Page.

15050	Basic Mechanical Materials and Methods
15100	Building Services Piping and Equipment
15190	Fuel Gas Piping
15410	Plumbing Fixtures
15600	Refrigeration Systems
15700	Heating, Ventilating, and Air Conditioning Equipment

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15800 Air Distribution

**DIVISION 16 - ELECTRICAL (By M.E.P. Engineer of Record)**

The Sections within this Division are the responsibility of the Electrical Engineer. The Engineering Consultant, the seal and license number of the Professional Engineer registered in the State where the project is located, are also shown on the Seals Page.

16050 Basic Electrical Materials and Methods  
16080 Protective Device Settings Report  
16100 Wiring Methods  
16402 Low Voltage Service and Distribution  
16410 Enclosed Switches and Circuit Breakers  
16442 Branch Circuit, Distribution Panelboards, and Switchboards  
16500 Lighting  
16700 Communications

**OWNER FURNISHED REFERENCES**

Appendix A Products and Work by Owner or Separate Contractor  
Appendix B Testing, Inspection, and Observation by Owner

END OF TABLE OF CONTENTS

## SECTION 01100 - SUMMARY

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
1. Definitions.
  2. Work covered by Contract Documents.
  3. Work by Walmart or Separate Contractors.
  4. Contractor use of site and premises.
  5. Coordination with occupants.
  6. Partial occupancy.

## 1.2 REFERENCES AND STANDARDS

- A. Applicability: The publications listed in the REFERENCES paragraph of an individual section shall apply only to the extent referenced within the text of that section. Unless the Contract Documents include more stringent requirements, applicable construction industry standards form a part of these specification and have the same force and effect as if bound or copied directly into the Contract Documents. Publications are referenced within the text by the basic designation only.
- B. Publication Dates: Standards and publications referenced in the Specifications shall mean the latest edition as of the date of commencement of the Work as stated in Paragraph 3.1.4 of the Construction Contract between Walmart and Contractor unless otherwise specifically dated.
- C. Copies of Standards: Owner or the Architect will not provide copies of references cited within the specifications. Copies may be obtained directly from publication source.

## 1.3 DEFINITIONS

- A. Furnish: Purchase and deliver to project site, ready for installation.
- B. Install: Unpack, assemble, set in final position, fasten in place, make final connections, clean, adjust, and leave ready for use.
- C. Provide: Furnish and install.
- D. Receive: Accepting a delivery. (Entity responsible for accepting a delivery.)
- E. Final Connections: Complete plumbing, mechanical, and electrical connections as required and recommended by manufacturer for optimum operation of equipment.

## 1.4 WORK BY WALMART OR SEPARATE CONTRACTORS

- A. Walmart has its own forces who will perform certain Work on the project, items noted 'NIC' (Not In Contract) which will commence as indicated on the Construction Schedule.
- B. Walmart may award separate contracts for work at the Site, which will be executed concurrent with work of this Contract. Consult and cooperate with Separate Contractors to the full extent provided for in the Construction Contract between Walmart and Contractor. Work by separate contractors is specified in Appendix A.
- C. During setup of equipment by the Owner or separate contractors, make crane service available to hoist equipment directly from trucks to final position. Coordinate schedule with the Walmart Construction Manager.

## 1.5 CONTRACTOR USE OF SITE AND PREMISES

- A. Limit use of site to allow for:
  - 1. Walmart occupancy.
  - 2. Work by separate contractors and by Walmart.
  - 3. Use of site and premises by the public.
- B. Confine operations at site to areas permitted by Law, Ordinances, Permits and to Limits of Contract as shown on Contract Documents. Verify with Walmart Construction Manager acceptable locations where operations may occur so as not to disturb Owner operations or customer traffic.
- C. Do not unreasonably encumber site with materials or equipment.
- D. Do not load structure with weight that will endanger structure. **DO NOT STORE ROOFING MATERIALS ON THE EXISTING ROOF.**
- E. Assume full responsibility for protection and safekeeping of all products stored on premises whether purchased by Contractor or Owner. Move stored products, which interfere with operations of Owner or customer traffic.
- F. Carefully coordinate sequence of construction activity and operations with Walmart Construction Manager.
- G. Maintain the following conditions at all times during the construction period until possession by Walmart.
  - 1. Maintain building weathertight and secure.
  - 2. Maintain building security and fire alarm systems in operation. (In the event both systems should fail, the Fire Alarm System shall have priority over the Security System.)
    - a. Contract with local alarm company to maintain service, and repair existing systems as required due to work relating to this Contract.
    - b. Alarm Company:
      - 1) Visit site and be familiar with existing conditions.
      - 2) Respond to service calls within 24 hours.
    - c. Provide on-site guard services in the event the existing system is disabled for 8 hours or more.
    - d. Coordinate security alarm with Section 01500 - Temporary Facilities and Controls.
    - e. Contact Walmart Alarm Central Control at (479) 273-4600 for additional information and coordination relating to work associated with existing alarm systems.
  - 3. Maintain access and egress from the building.

## 1.6 COORDINATION WITH OCCUPANTS

- A. Owner will occupy premises during entire period of construction for the conduct of Owner's normal, daily operations. Cooperate with Walmart Construction Manager in construction operations to minimize delays, inconvenience, or conflict to Owner's daily business operations and customer traffic. The Contractor shall obtain permission from the Owner for interruptions of utility services to the building. Accidental interruptions shall be restored immediately.
  - 1. Any Contractor work operations that may disrupt or interfere with Wal-Mart or building operation or function shall be reviewed and approved by Walmart Construction Manager.
  - 2. Submit written request for approval to Walmart Construction Manager 14 calendar days in advance of date Contractor work operations are required to begin.

## 1.7 PARTIAL OCCUPANCY

- A. Walmart will occupy any completed or partially completed portions of the Work.
- B. Cooperate with Walmart to minimize conflict, and schedule the Work to facilitate Walmart operations.
- C. Prior to Walmart occupancy in areas of new work, the following provisions shall be in place:
  - 1. Illuminated exit signs are operational.
  - 2. Exit doors, including required panic hardware, are operational.

3. Lighted, enclosed walkways and other temporary safety measures are in place if required by authorities having jurisdiction.
4. Fire sprinkler system is operational.
5. Doors required for Walmart security purposes are operational.

D. After Walmart occupancy:

1. Keep exit routes and exit doors free from obstructions.
2. Maintain exit signs and fire sprinkler system in operational condition.
3. Provide security for Walmart products, equipment, and operations.
4. Do not permit smoking in the building.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used

END OF SECTION



## SECTION 01131 - ALTERATIONS PROJECT PROCEDURES

## PART 1 - GENERAL

## 1.1 DESCRIPTION

- A. Summary: The procedures and administrative requirements of this Section apply to all of the following Sections of the Specification which are involved in alterations to the existing building.

## 1.2 RELATED REQUIREMENTS

- A. Section 01351 - Regulatory Compliance.
- B. Section 01500 - Temporary Facilities and Controls
- C. Section 01731 - Cutting and Patching
- D. Section 02023 - Selective Site Demolition
- E. Section 02251 - Shoring

## 1.3 SCHEDULING, ACCESS AND SECURITY

- A. Work Sequence:
  - 1. The existing premises will be occupied during the construction process. Coordinate sequence of work on project site with Owner's Construction Manager and Store Manager in order that Owner's operations may continue.
  - 2. The Owner's Construction Manager will require a job start meeting prior to any Work activity.
  - 3. The Construction Schedule is limited to a time frame established by Owner. Contact Owner's Construction Manager immediately if, at any time, construction schedule is not being met or if delays are foreseen.
  - 4. The Contractor shall develop a schedule of Work, which will be reviewed and approved by the Owner's Construction Manager, describing the starting and completion dates of the different phases of this Project. Owner reserves the right to revise this schedule to best meet the needs for the Store's operations. Revisions to the Construction Schedule shall be made by the Contractor at no additional cost to Owner. As the construction progresses, the Contractor shall give an update of the construction schedule to the Store Manager and Owner's Construction Manager on a weekly basis.
- B. Security is specified in Section 01500.
- C. Maintenance of Access and Operations:
  - 1. During period of construction, Owner will continue to perform normal activities in existing building. Maintain proper and safe Customer and Associates access to operational areas at all times.
  - 2. Schedule demolition and remodeling operations with Owner's Construction Manager and/or Store Manager in such a manner as to allow Owner's operations to continue with approved interruptions.
  - 3. During period of construction, do not obstruct in any manner existing exitways unless additional exitways are provided. Prior to removal of existing exitways (stairs, corridors, doors) as part of new Work, provide and maintain new exitways so as to maintain same number of exitways. Maintain existing fire doors in a operable condition. Obtain approval from Authorities Having Jurisdiction (AHJ) for all temporary modifications to the existing system.
- D. Maintenance of Existing Services
  - 1. Maintain environmental control in existing building, especially temperature, humidity and dust control.
  - 2. Provide temporary power, services and connections as required to maintain existing mechanical and electrical services in building.

3. Notify Owner's Store Manager and Construction Manager a minimum of three (3) days prior to each required interruption of mechanical or electrical services in building. Such interruptions shall be only at such times and for lengths of time as approved by the Owner's Construction Manager and/or Store Manager. In no event shall interruption occur without prior approval of the Owner's Construction Manager and/or Store Manager.
- E. Building Access/Construction Personnel Control.
1. Access to construction areas within building shall be as directed by Owner's Construction Manager.
  2. Restrict construction traffic to areas specifically designated by Owner's Construction Manager.
  3. Refer to the documents referenced in Section 01351 for Contractor Badge System and access control requirements.

PART 2 - PRODUCTS  
Not Used.

PART 3 - EXECUTION  
Not Used

END OF SECTION

SECTION 01230 - ALTERNATES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
  - 1. Alternate submission requirements of work included in Alternates.
- B. Related Sections:
  - 1. Construction Contract Between Wal-Mart and Contractor: Acceptance of Alternates in award of a Contract.

1.2 DEFINITIONS

- A. Alternate: An amount proposed by bidders and stated and defined on the Bid Form for certain work that may be added to or deducted from the base bid amount if Wal-Mart decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
  - 1. Alternates will be a part of the Work only if enumerated in the Agreement.
  - 2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.3 PROCEDURES

- A. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.
- B. Execute accepted alternates under the same conditions as other work of the Contract.

1.4 SUBMISSION REQUIREMENTS

- A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at the Owner's option. Accepted alternates will be identified in the Construction Contract between Wal-Mart and Contractor.

1.5 SCHEDULE OF ALTERNATES AND DESCRIPTION OF WORK INCLUDED IN ALTERNATES.

- A. Schedule of Alternates, when applicable, and descriptions thereof are shown on the Bid Form.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION

## SECTION 01255 (01 2613) - REQUEST FOR INFORMATION

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Requests for Information (RFI) procedures.

## 1.2 DEFINITION

- A. Requests for Information: A formal online process used during the construction phase to facilitate communication between the Contractor, the Owner's Construction Manager (CM) or the Mechanical Construction Manager (MCM), and the Professional of Record (POR) with regard to requests for additional information and clarification of the intent of the Contract Documents (Drawings and Specifications).
- B. Professional of Record (POR): The Architect of Record (AOR) or the Civil Engineering Consultant (CEC)
- C. Architect of Record (AOR): The prime consultant in charge of overall design and coordination of the project. The AOR will be the administrator for all construction RFIs classified as "BLDG".
- D. Civil Engineering Consultant (CEC): The Registered Engineer in responsible charge of the civil design for the project. The CEC will be the administrator for sitework RFIs classified as "SITE".
- E. Owner's Construction Manager (CM): The Owner's building and sitework Construction Manager for the Project.
- F. Mechanical Construction Manager (MCM): The Walmart Mechanical (HVAC, Refrigeration and BAS) construction manager for the Project.

## 1.3 REQUEST FOR INFORMATION SUBMITTAL

- A. Submit requests for information for conditions requiring clarification of the Contract Documents in Owner's online project document delivery application *Lucernex*. POR will not respond to requests for information unless requests conform to the format specified herein and include all required information. Faxed or emailed RFIs will not be reviewed
- B. Do not use Request for Information process during bidding phase. For questions during bidding phase, refer to Invitation to Bid issued by Owner's Contract Administrator.
- C. Submit in accordance with procedure as follows: (See Process Flow Chart at the end of this Section)
  - 1. Subcontractors, manufacturers, and suppliers shall submit request for additional information and clarification to Contractor.
  - 2. Contractor shall contact Owner's CM or MCM, as applicable, with requests for additional information or clarification. Owner's CM or MCM will not accept requests for information or clarification submitted directly from subcontractors, manufacturers, or suppliers.
  - 3. Owner's CM or MCM will provide response to Contractor or will direct Contractor to submit a formal Request for Information.
    - a. Submit a formal RFI only if authorized by the Owner's CM or MCM. Submittal to Construction RFI website signifies authorization has been given.
    - b. Generate Requests for Information by one source per project.
    - c. Submit one request for information per website entry.
  - 4. POR will review formal requests from Contractor and provide response within 3 working days.
  - 5. POR's response shall not be considered as a Change Order or Change Directive, nor does it authorize changes in the Contract Sum or Contract Time.

D. Scheduling, Costing, and Owner Provided Equipment Coordination: Direct to the Owner's Construction Manager.

1.4 PENALTY FOR FAILURE TO FOLLOW PROCEDURE

A. A \$250 administrative cost will be assessed to the Contractor for each Request for Information submitted which does not follow the procedure specified above.

1.5 REIMBURSEMENT FOR ARCHITECTURAL AND ENGINEERING FEES

A. The Contractor shall be charged administrative costs and professional fees incurred by Owner for additional Architectural and Engineering services associated with the correction of completed Work which is not in accordance with the Contract Documents. See Paragraph 8.7 of the Construction Contract Between Walmart and Contractor for provisions relating to Correction of Work.

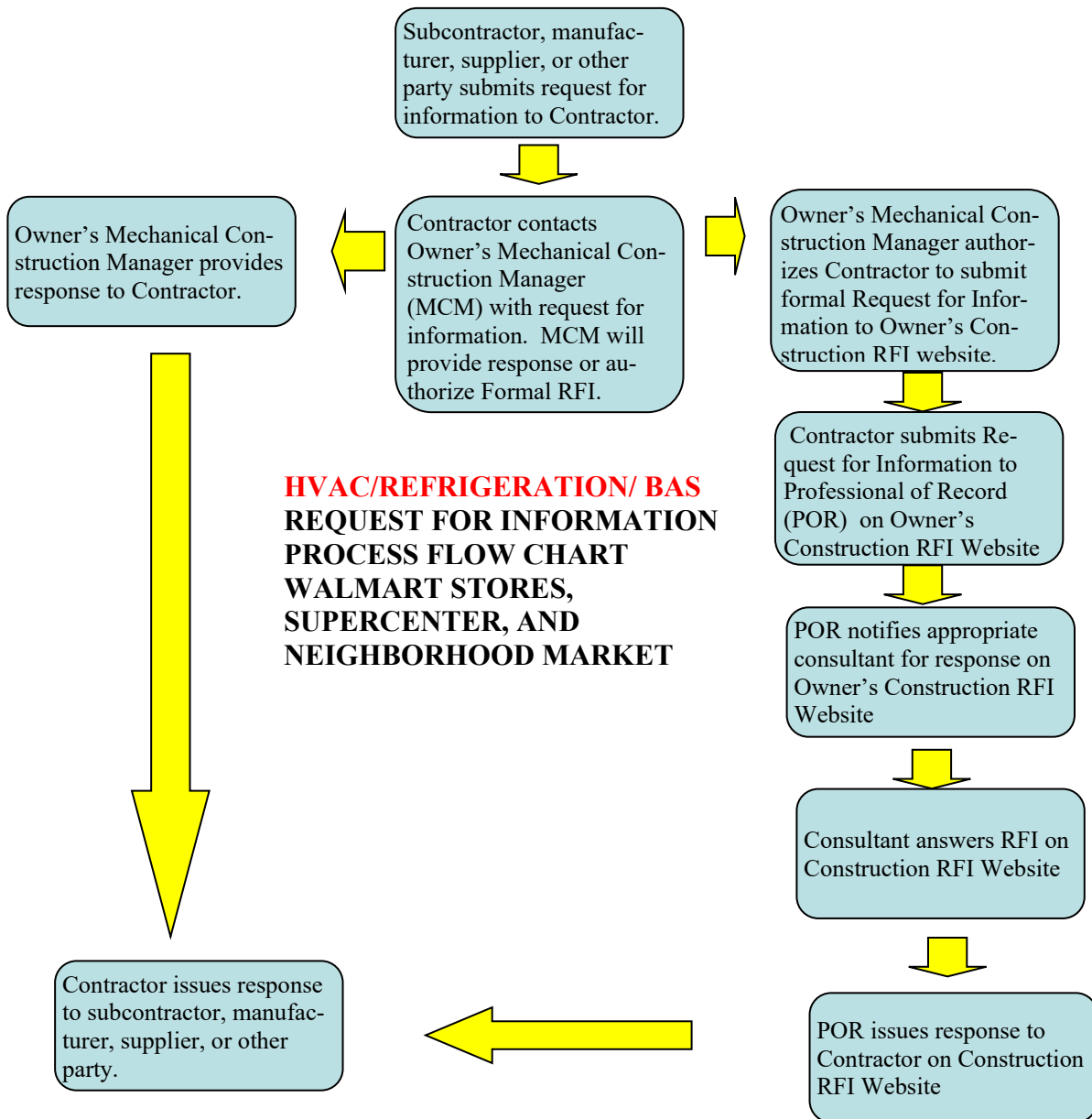
PART 2 - PRODUCTS

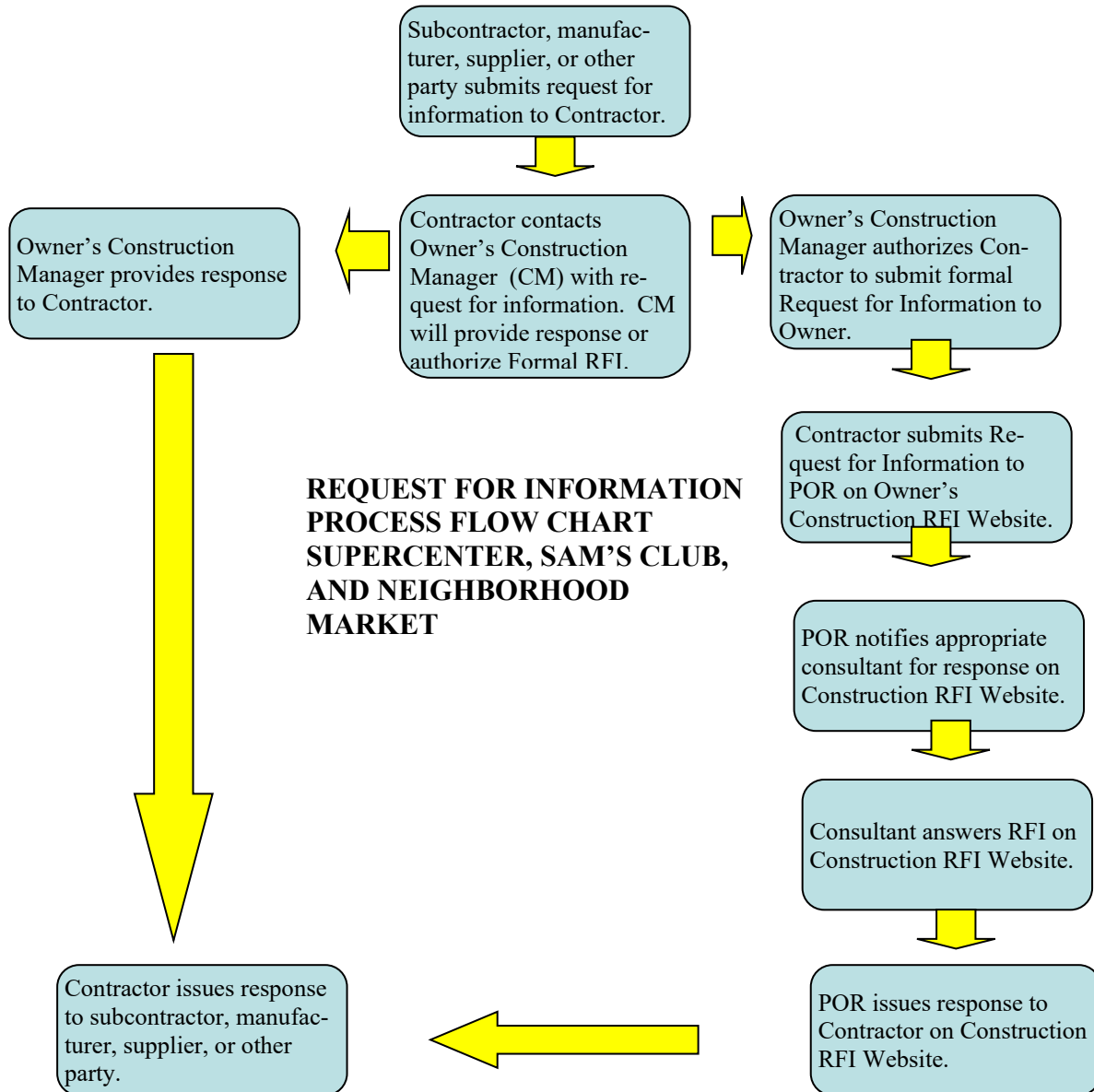
Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION





## SECTION 01310 - CONSTRUCTION MANAGEMENT AND COORDINATION

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Project Management and Coordination:
    - a. Definitions
    - b. Construction Manager
    - c. Project Coordination
- B. Related Requirements:
  - 1. Construction Contract between Walmart and Contractor: Owner's Construction Manager's rights and scope of authority.

## 1.2 DEFINITIONS

- A. Separate Contractor: A contractor (subcontractor, specialty contractor, or vendor) hired separately by Owner and outside of General Contractor's Construction Contract.
- B. Owner's Construction Manager: The Owner's representative in all matters relating to the Work of the Project. The person responsible for all approvals with the General Contractor. This person also coordinates with the Separate Contractors and the Owner's Store Planning Field Project Manager.
- C. Owner's Store Planning Field Project Manager: Owner-designated personnel who represents Owner during the Store Remodel. This person coordinates receipt of Owner-furnished items, coordinates moves of set up team, and assists in prioritizing work of Owner forces at the site.

## 1.3 OWNER CONSTRUCTION MANAGER

- A. Owner will assign this project to a Owner's Construction Manager.
- B. Cooperate with the Owner's Construction Manager in all matters relating to the Work on this project.
- C. During construction, coordinate use of site and facilities through the Owner's Construction Manager.
- D. Comply with Owner's Construction Manager's procedures for project communications, reports and records, and coordination with drawings, and comply with recommendations and resolution of ambiguities and conflicts.
- E. Comply with instructions of the Owner's Construction Manager for use of temporary utilities and construction facilities.
- F. Coordinate use of site during Owner fixture setup work under instructions of the Owner's Construction Manager.

## 1.4 RESPONSIBILITIES OF GENERAL CONTRACTOR AND SEPARATE CONTRACTORS

- A. The General Contractor shall provide necessary forces and subcontractors to complete the Work of the Project as described in the Contract Document (Drawings, Specifications, Addenda, and other modifications to the Contract). He is responsible for the supervision, quality control and costs for his employees and subcontractors.



- B. The General Contractor and Separate Contractors will provide a Construction Schedule to the Owner's Construction Manager for review and approval. The Contractors shall immediately contact the Owner's Construction Manager if the Work does not progress as scheduled. It is imperative that the Contractors keep close communication with the Owner's Construction Manager regarding the progress of the Project.
- C. At the commencement of construction, the Owner's Construction Manager, Owner's Store Manager, General Contractor, Separate Contractors and the Store Planning Field Project Manager will review the Construction Schedule. The Construction Schedule is set up on a weekly basis and must be followed unless deviations are authorized by the Owner's Construction Manager. (Refer to Section 01500 for posting of schedule.)
- D. The General Contractor and Separate Contractors shall communicate at all times with the Store Manager, other Subcontractors and the Store Planning Field Project Manager to facilitate the construction and ensure it is completed within the approved time schedule.
- E. Upon completion of a portion of the Work (Item, Trade, etc.), that portion of the Work must be 100% complete prior to proceeding to the next phase or portion of Work.
- F. The General Contractor shall be responsible for the coordination of the Remodel work of all Separate Contractors with the Owner's Construction Manager and the Owner's Store Manager.
- G. The Construction Manager will determine what work shall be done during normal operating hours (store hours) and during "closing" hours.
- H. The General Contractor will coordinate with the Store Planning Field Project Manager the delivery of Owner-furnished items.
- I. The General Contractor shall also be responsible for coordinating the location of storage trailers/containers for Contractor-supplied materials and equipment. (Refer to Section 01500). The General Contractor shall be responsible for permits required for temporary storage facilities (trailers/containers).
- J. Owner will not be responsible for the loss of any tools or equipment. Owner will also not be responsible for the cost of any rental tools. This is each Contractor's responsibility and should be included in his price proposal.
- K. Contractors shall not open any type of charge account within the Store and store markdowns will not be allowed. All items purchased in the Store shall be paid for at the time of purchase. Contractors should not receive any discounts for any items purchased within the Store. The use of Owner's name will not be allowed on any accounts.
- L. Contractors shall comply with Owner policy regarding gratuities. No Contractor may receive any gratuities from any company providing services or materials for any Owner Projects. Contractors are not entitled to receive any employee benefits from Owner.
- M. The General Contractor shall be responsible for timely removal of the construction trailer as directed by the Owner's Construction Manager.
- N. Owner may provide Store Associates as required to assist the General Contractor and Separate Contractors in the remodeling. The Owner's Store Planning Field Project Manager will determine the number of Store Associates that will be provided on a job basis. Owner's Store Associates shall not be allowed to operate power equipment, be used as carpenters, or perform work from scaffolds, ladders or hoists.
- O. The General Contractor and Separate Contractors are responsible for obtaining a final inspection from the appropriate Building Official or Authority Having Jurisdiction (AHJ). If a Certificate of Occupancy is required, obtain it from the proper authorities. A copy of all final inspection documentation or Certificates of Occupancy shall be included in the final Closeout Documents (Maintenance Book/Closeout Book).

#### 1.5 RESPONSIBILITIES OF OWNER

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- A. The Owner's Store Planning Field Project Manager shall be responsible for the following construction coordination items:
  - 1. Supervision and coordination of Store Associates assisting with construction.
  - 2. Unloading of fixture trucks and the organization of the off site warehouse.
  - 3. Transportation of certain Owner furnished materials required for construction from the warehouse to the Store.
  - 4. Supervise the movement of Store merchandise and fixtures as required for the painting, flooring, ceiling, carpentry and Owner Separate Contractors.

#### 1.6 PROJECT COORDINATION

- A. Coordinate scheduling, submittals, and work of the various Sections of specifications to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed at a later date and under separate contracts.
- B. Obtain necessary drawings, manufacturer's product data, and other necessary data to provide a complete and proper installation.
  - 1. Check field dimensions prior to installing equipment and furnishings. Verify necessary clearances and means of access from equipment storage to final position.
  - 2. Make shop drawings and manufacturer's rough-in requirements available to trades involved.
- C. Verify that utility requirements of operating equipment are compatible with building utilities. Coordinate work of various specification Sections for installation and final connection of equipment.
  - 1. Verify that mechanical, plumbing, and electrical rough-ins have been properly located.
- D. Coordinate space requirements and installation of mechanical and electrical Work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduits as closely as practicable. Make runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- E. In finished areas, conceal pipes, ducts, and wiring in the construction. Coordinate locations of fixtures and outlets with finish elements.
- F. Coordinate completion and clean up of work of separate Sections in preparation for Substantial Completion and for portions of Work designated for Owners partial occupancy after possession.
- G. 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.

#### PART 2 - PRODUCTS

Not Used.

#### PART 3 - EXECUTION

Not Used.

END OF SECTION

## SECTION 01311 - PROJECT MEETINGS

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Preconstruction conference.
  - 2. Preinstallation conferences.
  - 3. Progress and quality control meetings.

## 1.2 PROJECT MEETINGS

- A. Conduct project meetings, as a part of the overall project coordination effort, to coordinate construction activities and Work.

## 1.3 ATTENDEES' AUTHORITY

- A. Persons designated by Contractor, subcontractors, and suppliers to attend project meetings: Possess authority to commit entities they represent to items agreed upon in project meetings.

## 1.4 PRECONSTRUCTION CONFERENCE

- A. Schedule a pre-construction conference at project site or other designated location after execution of the Contract and one week prior to start of Work.
- B. Attendance: Wal-Mart Construction Manager, Store Manager, Owner's Representative, Contractor Project Coordination Administrator, Contractor Quality Control Representative, Contractor Project Field Superintendent, roofing, mechanical, plumbing, fire protection, and electrical subcontractor field supervisory personnel.
  - 1. Additional Wal-Mart personnel (including Wal-Mart Construction Manager) may attend by telephone.
- C. Minimum Agenda:
  - 1. Organizational arrangement of Contractor's forces and personnel, and those of subcontractors, material suppliers and Wal-Mart Construction Manager.
  - 2. Contractor certificates of insurance.
  - 3. Status of Contractor-required submittals; list of subcontractors, schedule of values, etc.
  - 4. Approved Progress Schedule. Work hours. Work outside of normal working hours.
  - 5. Specific building regulations for Work within and adjacent to existing building.
  - 6. Critical work sequencing.
  - 7. Procedures for processing field decisions; Request for Information procedures.
  - 8. Change order process and procedures for processing change orders.
  - 9. Procedures for processing applications for payment. Contract closeout procedures.
  - 10. Wal-Mart furnished equipment and materials process, procedures, and coordination.
  - 11. Wal-Mart installed equipment and materials process, procedures, and coordination.
  - 12. Wal-Mart separate vendor process, procedures, and coordination.
  - 13. Submittal process, procedures, and coordination.
  - 14. Temporary facilities and controls by Owner.
  - 15. Temporary utilities provided by Owner.
  - 16. Procedures for preparation and maintenance of Project Record Documents.
  - 17. Contractor office, work, storage, and parking areas.
  - 18. Work area security requirements.
  - 19. Safety procedures, first aid, and occupational safety and health requirements.
  - 20. Housekeeping, cleanliness, noise and dust control of work areas.

21. Quality of workmanship required.
22. Wal-Mart furnished testing and inspection services.
23. Contractor's quality control procedures and requirements, inspection, testing, and documentation.

D. Documentation: Record minutes of conference and distribute copies to Wal-Mart Construction Manager, participants, and those affected by decisions made, 2 working days after conference date. Recording, producing, and distributing by Contractor.

#### 1.5 PREINSTALLATION CONFERENCES

A. When required in individual specification Section, conduct a Preinstallation Conference at project site prior to start of Work of Section or related sections.

B. Notify Wal-Mart Construction Manager 14 working days in advance of meeting date.

C. Attendance Required: Wal-Mart Construction Manager, Store Manager, Owner's Representative, Contractor Project Coordination Administrator, Contractor Quality Control Representative, Contractor Project Field Superintendent, Separate Contractor, any subcontractor, supplier, or installer directly affecting, or affected by, Work of specific Section.

D. Minimum Agenda: Review conditions of installation, progress of other construction activities, and preparations for Work of Section or related Sections, including requirements for:

1. Contract documents.
2. Related change orders.
3. Equipment and material deliveries.
4. Shop drawings and product data.
5. Possible conflicts and compatibility problems.
6. Weather limitations.
7. Time schedules.
8. Manufacturer's instructions and recommendations.
9. Compatibility of materials.
10. Acceptability of substrates.
11. Temporary facilities required.
12. Space and access limitations.
13. Governing codes and regulations.
14. Inspection and testing requirements.
15. Required performance results.

E. Documentation: Record minutes of conference and distribute copies to Wal-Mart Construction Manager, participants, and those affected by decisions made, 2 working days after conference date. Recording, producing, and distributing by Contractor.

#### 1.6 PROGRESS AND QUALITY CONTROL MEETINGS

A. Schedule and conduct progress meetings throughout the progress of the Work at intervals determined by the Wal-Mart Construction Manager.

B. Attendance Required: Wal-Mart Construction Manager, Owner's Representative, Contractor Project Coordination Administrator, Contractor Quality Control Representative, and Contractor Project Field Superintendent.

C. Minimum Agenda: Review items of significance that may affect project progress, including the following:

1. Minutes of previous meetings.
2. Work progress in relation to Contractor's construction schedule.
3. Status of required submittals.
4. Payment request status. Documentation of information for payment requests.
5. Field observations, Requests for Information, discussions of problems, and agreement on solutions.
6. Quality of materials and workmanship.

7. Corrective measures to regain quality of materials and workmanship; status of products, assemblies, or systems requiring replacement.
  8. Status of change orders.
  9. Corrective measures to regain projected schedules.
  10. Planned progress for period prior to next scheduled Progress Meeting.
  11. Effect of proposed project changes (if any) on construction schedule and coordination.
  12. Temporary facilities and services.
  13. Jobsite housekeeping and cleanliness.
- D. Documentation: Record minutes of conference and distribute copies to Wal-Mart Construction Manager, participants, and those affected by decisions made, 2 working days after conference date. Recording, producing, and distributing by Contractor.
- E. Construction Schedule Update: Revise construction schedule after each progress meeting where schedule revisions have been made or recognized. Issue updated schedule concurrently with report of meeting.

#### PART 2 - PRODUCTS

Not Used.

#### PART 3 - EXECUTION

Not Used.

END OF SECTION

SECTION 01312 - PROGRESS MEETINGS

PART 1 - GENERAL

1.1 PRE-CONSTRUCTION MEETING

- A. A pre-construction meeting will be held at the project site prior to beginning work at a time designated by the Owner.
- B. The Wal-Mart Construction Manager, Contractor's Project Manager, Contractor's Superintendent, and major subcontractors shall be present.
- C. The following shall serve as a minimum agenda:
  - 1. Construction schedule.
  - 2. Critical work sequencing.
  - 3. Designation of responsible personnel.
  - 4. Processing of field decisions and changes to the Work.
  - 5. Walk-through inspection and field determination of scope of work and verification of Construction Documents.

1.2 PROGRESS MEETINGS

- A. Scheduled progress meetings at the job site are required.
- B. The Wal-Mart Construction Manager, Contractor's Superintendent and major subcontractors (as appropriate to the agenda) shall be present.
- C. The purpose of these progress meetings is to review the schedule of the Project for the next 2 weeks. The following shall serve as a minimum agenda:
  - 1. Field observations, problems and conflicts.
  - 2. Problems that may impede construction schedule.
  - 3. Review of delivery schedules.
  - 4. Coordination of schedules of different trades and delivery of Owner-furnished products and materials. Coordination with Wal-Mart separate contractors and their scope of work.
  - 5. Walk-through inspection and determination of additional scope of work and repairs to the Project.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION

## SECTION 01320 - CONSTRUCTION PROGRESS DOCUMENTATION

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Progress Schedules and Reports
- B. Related Requirements:
  - 1. Construction Contract Between Walmart and Contractor. Requirements for construction schedules and reports. Ref Articles 1.1.15 and 3.8.

## 1.2 CONSTRUCTION SCHEDULE

- A. Using the Milestone Completion Dates identified in Exhibit 1.1.16 of the Construction Contract; the Contractor shall develop the detailed CPM Construction Schedule with activity time duration in calendar days further describing his method for performing the Work. The Contractor shall review the Contractor's schedule with the Owner's Construction Manager within 3 weeks from award of Contract, or at the Pre-Construction Meeting, whichever is first. Failure of the Contractor to have a construction schedule approved by the Owner's Construction Manager will be considered cause to withhold progress payments.
  - 1. The Milestone Completion Dates identified in Exhibit 1.1.16 of the Construction Contract shall not be construed as an indication by the Owner as to means, methods, or techniques of construction to be employed by the Contractor.
  - 2. Critical path activities shall be indicated on the Contractor's detailed construction schedule.

## 1.3 CONSTRUCTION PROGRESS CHART

- A. Progress of the Project will be monitored using charts produced from the CPM Schedule. Requirements herein provide for planning and execution of the Work and are to assist the Wal-Mart Construction Manager in evaluating progress of the Work economically and chronologically.
- B. The Contractor shall be familiar, in detail, with the Milestone Completion Dates identified in Exhibit 1.1.16 of the Construction Contract. By submitting his bid, the Contractor acknowledges that the Construction milestones are feasible, reasonable, and are a workable schedule for the Work.
- C. Delivery conditions and lead times for Wal-Mart Furnished Items are specified in the Delivery Schedules in Section 01600. Coordinate delivery of these items with progress of the Work.
- D. Prior to construction, the Contractor may request reasonable changes to the Construction Progress Schedule Chart, provided delivery dates specified in Section 01600 and the contract completion date are not changed. The Wal-Mart Construction Manager will review requested changes. Upon approval by Wal-Mart, Progress Schedule Chart shall become the "Approved Construction Progress Chart" by which the Contractor shall plan, organize, direct, coordinate, and execute the Work, and the basis of evaluating progress of the Work.
- E. If, in the opinion of the Wal-Mart Construction Manager, any of the dates specified in Section 01600 are not completed by the Contractor on or before the stated time period and after 48 hours written notice to the Contractor, Wal-Mart may proceed to carry out the work in accordance with Article 2.4 of the Construction Contract.
- F. The Contractor shall perform work directed by the Wal-Mart Construction Manager to meet the Wal-Mart contract completion date and shall maintain the original management and supervision team to continue their office and job site duties on a full-time basis through final completion and/or any other time the Contractor has any work being performed on the project regardless of the date or condition of project completion.

## 1.4 SCHEDULE UPDATES

01320-1

- A. The Contractor shall provide to the Wal-Mart Construction Manager regular updated reports on the Construction Schedule as determined by the Wal-Mart Construction Manager. The Contractor shall maintain a current weekly updated detailed construction schedule in the site construction field office.
  - 1. Construction Schedule Updating: Progress information to be included in schedule updates includes actual start and finish dates, percentage complete, remaining duration or projected finish dates for all activities in progress during reporting period. Schedule updates may also include approved added activity descriptions.

#### 1.5 RECOVERY PLAN

- A. Should the updated approved Construction Schedule show the Contractor to be behind schedule, the Contractor shall immediately devise a plan for recovery of lost time within one week and submit it to the Wal-Mart Construction Manager for approval. Once approved by the Wal-Mart Construction Manager, the Contractor shall immediately put the recovery plan into action.
- B. During the period covered by the recovery plan, the Contractor's progress will continue to be monitored against the Approved Construction Progress Chart. If the Contractor does not recover from delay as detailed in the recovery plan, Wal-Mart may exercise the option to carry out the work as specified above.
- C. The Contractor shall bear all costs and expenses related to recovery from the Contractor's delays, including costs, expenses, and lost sales incurred by Wal-Mart.

#### PART 2 - PRODUCTS

Not Used.

#### PART 3 - EXECUTION

Not Used.

END OF SECTION



## SECTION 01330 - SUBMITTAL PROCEDURES

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Submittal procedures prior to and during construction.
- B. Related Sections:
  - 1. Section 01600 - Product Requirements: Requirements for product selection and product options.
  - 2. Section 01770 - Contract Closeout: Closeout submittals.

## 1.2 PROCESS AND RESPONSIBILITIES

- A. Contractor Responsibilities:
  - 1. Submit required submittals to Architect unless otherwise specified.
  - 2. Submit required submittals in hard copy or electronically by email. Electronic documents shall be in PDF format. Hard copy documents submitted to the Contractor by suppliers and subcontractors shall be scanned by the Contractor to PDF prior to electronic submittal.
  - 3. Comply with submittal requirements defined within individual Sections. Submittals procedures described herein shall apply unless otherwise stated in individual Sections.
  - 4. Package each submittal appropriately for transmittal and handling.
  - 5. Identify Project, Contractor, subcontractor or supplier, pertinent Drawing sheet and detail numbers, and Specification Section number, as applicable.
  - 6. Assemble, coordinate, and review submittals of subcontractors, suppliers, and manufacturers.
  - 7. Review submittal for verification of products required, field dimensions, adjacent construction, and coordination of information.
  - 8. Apply Contractor's Submittal Review stamp, signed or initialed and dated, certifying compliance with Contract Documents.
  - 9. Identify email transmittal of submittals in the subject line as follows:
    - a. Walmart Store #, City, State, Project type RM, OGP, etc.), submittal name (e.g. concrete mix design, sieve analysis, etc., including Section number).
  - 10. Forward executed copy of Submittal Review Form to supplier within 5 days after receipt of submittal with copies to Architect and Wal-Mart's Construction Manager.
  - 11. Schedule submittals to expedite the Work. Coordinate submission of related items into single submittal, unless otherwise specified.
  - 12. Submit submittals items required within an individual Specification Section into a single submittal.
  - 13. Identify variations from Contract Documents and limitations of product and system which may be detrimental to successful performance of the completed Work.
  - 14. Provide space on submittal for Contractor, Architect, and Architect's Consultant review stamps.
  - 15. Allow 10 working days for review.
  - 16. Revise and resubmit submittals when required. Identify changes made since previous submittal.
  - 17. Notify Vendor or Subcontractor of approval by Authority Having Jurisdiction of Deferred Submittal package.
  - 18. Distribute copies of reviewed submittals to concerned parties and to Record Documents file. Instruct parties to promptly report inability to comply with provisions.
- B. Supplier Responsibilities - Wal-Mart (Owner) Furnished Products:
  - 1. Subcontractors, vendors, and suppliers (including suppliers of Wal-Mart (Owner) furnished products) shall forward copies of submittals to the Contractor.
  - 2. Prepare submittals in accordance with requirements in individual Specification Sections and Contractor responsibilities specified herein.
- C. Architect Responsibilities: Review submittals and take appropriate action as follows.
  - 1. Shop Drawings and Product Data: Architect will mark submittals to indicate appropriate action.

2. Return Architect reviewed Submittals to Contractor by email or mail carrier service providing delivery tracking.
3. Submittals for Information: Architect will not return submittals sent for information only.
4. Forward submittals to proper sub-consultant for review as necessary.

D. Unrequested Submittals: Submittals transmitted to Architect or Architect's Consultants that are not indicated or requested will not be reviewed. Architect will dispose of unrequested submittal items.

### 1.3 TRANSMITTAL

A. Transmit each submittal using a transmittal form. Submit to Architect.

1. Transmit submittals to be reviewed by Architect to:  
Architect of Record  
*Massa Multimedia Architecture, PC*  
3297 Route 66  
Neptune, NJ 07753
2. Transmit submittals to be reviewed by Structural Engineer of Record to:  
Structural Consultant  
*Johnston Burkholder Associates*  
930 Central  
Kansas City, Missouri 64105
3. Transmit 3 copies of fire protection submittals to the Wal-Mart Fire Protection Consultant listed below within 21 days of prime contract award. Send one copy of the submittal transmittal to the Architect listed above.  
Fire Protection Engineer of Record  
*Henderson Engineers, Inc.*  
8345 Lenexa Drive, Suite 300  
Lenexa, Kansas 66214
4. Transmit sitework submittals directly to Civil Engineer of Record.  
*Atwell, LLC*  
1850 Parkway Place, Suite 650  
Marietta, GA 30067

B. In addition to recipients stated above, transmit submittals to those parties as may be required in the individual specification section.

### 1.4 DEFERRED SUBMITTALS

A. Definition: Deferred Submittal are submittals required by the AHJ for code compliance but which, rather than being submitted at the time of permit application, have been allowed by the AHJ to be deferred until after Contract award to enable the successful Contractor, Subcontractor, or Supplier to submit the applicable submittals.

B. Submit the deferred submittals to the extent indicated on the Deferred Submittal Table located on the Drawing Cover Sheet.

C. Prepare submittals in accordance with requirements stated in the applicable individual Specifications Sections and the applicable requirements herein

1. Storage Rack System (Wal-Mart Vendor): Storage Rack System is not specified in an individual section. Requirements are as follows:
  - a. Coordinate with Wal-Mart Store Planning through the Wal-Mart Construction Manager to obtain copy of approved submittal package.
  - b. Shop Drawings:
    - 1) Floor plan showing locations and types of rack systems.
    - 2) Details of each type of rack construction showing configuration, dimensions and materials.
    - 3) Details of rack connection to building floor or structure.
    - 4) Seismic bracing and connections (where required).

- c. Calculations: Structural calculations for rack connections to building floor or structure and seismic provisions.

D. Process:

1. Immediately after award of the Contract, the Contractor shall contact the AHJ to coordinate and determine the AHJ requirements for deferred submittals. Information obtained shall include such requirements as number of copies; extent of detail of information to be submitted; review, if required, by Professional of Record (Architect or Engineer); and other necessary process and procedural requirements.
2. The Contractor, or other entity, responsible for the submittal shall submit, track, and report submittal status to the Wal-Mart Construction Manager through final approval and issue of permit.
3. Communicate with vendors, suppliers, and Subcontractors the AHJ requirements for deferred submittals. Receive, review, and stamp submittals in accordance with submittal requirements herein.
4. Transmit deferred submittals directly to AHJ unless otherwise requested by AHJ to obtain prior review and approval by Professional of Record.
5. Upon approval by AHJ, obtain permits and pay permit fees and other fees required by the AHJ.
6. Attach approved deferred submittals to the approved "Permit Set" documents at the project site.
7. Do not install deferred submittals until corresponding submittal documents have been approved by the AHJ.

## 1.5 SUBMITTAL REQUIREMENTS

A. Shop Drawings

1. Submit Drawings with graphic information at accurate scale. Show dimensions and note which dimensions are based on field measurement. Identify materials and products in Work shown. Indicate compliance with specified standards and special coordination requirements. Do not use reproductions of Contract Drawings as Shop Drawings.
2. Include on each Shop Drawing the drawing title, number, original issue date, and revision numbers and dates, in addition to other required identifying information.
3. Identify details by reference to sheet, detail, schedule, or room names shown on the Contract Drawings.
4. Identify numerical values in English units.
5. Size: Not less than 8-1/2 by 11 inches nor more than 30 by 42 inches.
  - a. For Shop Drawings submitted on sheets larger than 8-1/2 x 11 inches, submit reproducible transparency and blue line or black line reproduction.
  - b. For Shop Drawings submitted on sheets 8-1/2 x 11 inches, conform to requirements for Product Data and submit as a bound volume for submittal required.
6. Number of Copies Required: Submit one reproducible transparency and one blue line or black line reproduction. Submit additional copies to AHJ for approval if required. Comply with requirements of AHJ with regard to signing and sealing of submittals by Registered Professional licensed in the State in which project is located.
  - a. One copy will be returned to the Contractor.
  - b. Bar Joists and Joist Girders, and Steel Roof Deck: Owner's Supplier will submit Shop Drawings and bills of materials directly to Structural Engineer of Record via email.

B. Product Data

1. Manufacturer's standard schematic drawings and diagrams:
  - a. Clearly mark to identify pertinent products.
  - b. Show performance characteristics and capacities.
  - c. Show dimensions and clearances required.
  - d. Show wiring or piping diagrams and controls.
  - e. Modify drawings and diagrams to delete information not applicable to this work.
  - f. Supplement standard drawings and diagrams to provide complete information applicable to this work.
2. Mark each copy to identify applicable products, models, options, and other data. Supplement Product Data with material prepared for the Work to satisfy submittal requirements for which Product Data does not exist. Note that the material is developed specifically for this Contract.
3. Submit Product Data for each Section in one complete submittal. Include table of contents listing page and catalog item numbers for Product Data.
4. Indicate, by prominent contrasting color notation on each product being submitted, the Specifications Section and paragraph numbers to which it pertains.

5. Where printed Product Data includes information on several products, some of which are not required, mark copies to indicate information applicable to Work and clearly cross out other information not applicable to Work. Include the following information:
    - a. Manufacturer's printed recommendations or instructions.
    - b. Compliance with referenced standards.
    - c. Application of testing agency labels and seals.
    - d. Notation of dimensions verified by field measurement.
    - e. Notation of coordination requirements.
  6. Product Data For Information: Written information not requiring action by Wal-Mart Construction Manager or Architect; for verification of compliance with requirement. Submittal not complying with requirements will be rejected.
  7. Number of Copies Required: Four.
- C. Engineering Calculations
1. Submit calculations signed and sealed by a Registered Professional Engineer licensed in the State where project is located. Comply with requirements of Authority Having Jurisdiction with regard to signing and sealing of submittals.
- D. Certifications
1. Certify manufacturer or installer's qualifications, compliance with tests or specified criteria, or other factors as required in individual Specification Sections.
  2. Submit supporting reference data, affidavits, and certifications as required.

## PART 2 - PRODUCTS

Not Used.

## PART 3 - EXECUTION

Not Used

END OF SECTION

## SECTION 01351 – REGULATORY COMPLIANCE

## PART 1 - GENERAL

## 1.1 SUMMARY

## A. Section Includes:

1. Contractor's regulatory compliance requirements and responsibilities.
2. Owner's compliance performance standards and expectations.

## B. Related Requirements and Sections:

1. Construction Contract Between Owner and Contractor (Contract) - Exhibit 3.6.
2. Owner's Compliance Performance Standards for Construction (CPS) as specified in the contract addendum.
  3. Section 01500 - Temporary Facilities and Controls.
  4. Section 01550 - Tension Pole Dust Barrier Systems.
  5. Section 01740 - Cleaning and Trash Disposal.
  6. Section 02023 - Selective Site Demolition.
7. Section 02370 - Erosion and Sedimentation Control (Including SWPPP).
  8. Section 13300 - Vertical Barrier Net System.

## 1.2 PROCESSES, PROCEDURES AND RESPONSIBILITIES

- A. Comply with all compliance obligations, federal, state, and local laws described in the Contract Documents including: Contract, Specifications, Drawings, and applicable Owner's Compliance Performance Standards (CPS).
- B. Do not use Owner's CPS in place of or as a substitute for developing and implementing the Contractor's own compliance programs.
- C. Create and maintain a hard-copy site-specific "Compliance Binder," including all associated documents in accordance with the requirements in the Owner's CPS manual.
- D. Do not create conditions that would cause harm to Owner's associates or members or prevent Owner's compliance with applicable laws.
- E. Follow and uphold the applicable Owner's compliance standards including responsibilities, processes and procedures, compliance acknowledgements, training, documentation, forms, tracking and reporting.
- F. Comply with all requirements set within the Contract Documents, including but not limited to: references and definitions, document management, safety requirements and safety plans, hazard safeguards, dust walls and barricades, hazardous materials and safety data sheets, respirable crystalline silica, hot work, fire watch, electrical work and supervision, lockout tagout, fuel storage, crane operations, confined spaces, edge protection netting, emergency exits, toxic and hazardous substances, asbestos, mold, site security and protection, labor work verification programs, badging and access control, waste management and disposal, hazardous waste management, waste container access restrictions, spills, construction stormwater permitting, sanitary waste water and sewage management.

END OF SECTION

## SECTION 01452 – CONTRACTOR’S QUALITY CONTROL

## PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes:
1. Administrative and procedural requirements for Contractor quality assurance and quality control.
- B. Related Requirements: The following list is intended to aid in locating work related to or dependent on the scope of Work in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
1. Construction Contract between Walmart and Contractor: Inspections, testing, and approvals required by public authorities.
  2. Section 01454 – Architect-Engineer Quality Assurance.
  3. Section 01455 - Testing, Adjusting, and Balancing: Contractor procurement of test and balance for heating, ventilating, and air conditioning systems.
  4. Section 01770 - Contract Closeout: Project Record Documents.
  5. Appendix B - Testing, Inspection, and Observation by Owner.
    - a. Quality Requirements of Owner’s Construction Testing laboratory (CTL) and services. (Formerly included in Section 01458.)
    - b. Architect-Engineer Site Observation: Site observation by Owner’s Architect and Engineer Consultants.
    - c. Civil Engineering Consultant Site Observation: Site observation by Owner’s Civil Engineering Consultant.
- C. Contractor testing and inspection are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
1. Contractor testing and inspection includes testing or inspection to be performed by and under the responsibility of the General Contractor as well as that required by the manufacturer, manufacturer’s representative, product supplier, or other party under the responsibility of the Contractor.
  2. Requirements in this section are independent of testing and inspection specified for the Owner’s Construction Testing Laboratory (CTL) specified in Appendix B. Testing and inspection by the CTL will be paid for by the Owner at no cost to the Contractor.
  3. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
  4. Requirements for Contractor to provide quality assurance and control services required by Architect, Owner’s CTL, Owner’s Construction Manager, or authorities having jurisdiction are not limited by provisions of this Section.

## 1.2 DEFINITIONS

- A. Testing: Evaluation of systems, primarily requiring physical manipulation and analysis of materials, in accordance with approved standards.
- B. Inspection: Evaluation of systems primarily requiring observation and engineering judgement.
- C. Quality Assurance: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will substantially comply with construction documents.
- D. Quality Control: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction substantially comply with construction documents.

- E. Quality assurance and quality control may be performed by either the Contractor or the Construction Testing Laboratory employed by the Owner.
- F. Mockups: Full-size, physical assemblies that are constructed on-site. Mockups are used to verify or demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples. Approved mockups establish the standard by which the Work will be judged.
- G. Architect of Record (AOR): The prime consultant in charge of overall design and coordination of the building.
- H. Engineer of Record (EOR): The Registered Engineer in responsible charge of Mechanical, Electrical, Fire Protection, and Plumbing engineering design for the project.
- I. Structural Engineer of Record (SER): The Registered Engineer in responsible charge of the structural design for the project.
- J. Civil Engineering Consultant (CEC): The Registered Engineer in responsible charge of the civil design for the project.
- K. Architect - Engineer (A/E): A collective term to include the AOR, CEC, SER, and the Mechanical, Electrical, and Fire Protection EOR.
- L. Construction Testing Laboratory (CTL): The independent testing and inspection agency employed by the Owner.
- M. Construction Manager (CM): Owner's representative overseeing the construction and installation of the building and systems to maintain the project schedule, cost, quality, safety, scope, and function.
  - 1. As specific to the project, CM may be the Mechanical Construction Manager, Owner's Construction Manager, or Owner's Third Party Mechanical Construction Manager.
- N. Independent Test and Balance Agent (TBA or ITBA): The HVAC testing and balancing agency employed by the Owner.
- O. Special Inspector (SI): The Special Inspector under the direct supervision of a registered civil/structural engineer (unless otherwise specified) regularly engaged in inspection and experienced with the type of work requiring related testing and inspection. The categories of special inspector are specified in Appendix B.
- P. Building Official: The Officer or his duly authorized representative charged with the administration and enforcement of the local building code.
- Q. Deviation: A deviation is any item or component of work that does not substantially conform to the requirements of the construction documents and which has not been corrected by the end of business on the day it is identified.

### 1.3 CONFLICTING REQUIREMENTS

- A. General: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect/Engineer for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. Refer uncertainties to Architect/Engineer for a decision before proceeding.

### 1.4 SUBMITTALS

- A. Submit Test and Inspection Reports within three working days of T&I occurrence.

- B. Submit required reports and other items to the following:
  - 1. AOR: (Construction Administration Leader).
    - a. One copy of Site Work T&I.
    - b. Three copies of Building T&I. AOR will transmit one copy of Bldg T&I to Structural Engineer of Record (SER).
    - c. Report of non-conforming work.
  - 2. Site Work Civil Engineering Consultant (CEC): One copy. (Site work T&I only.)
  - 3. Contractor: Three copies.
  - 4. Building Official: Quantities as required.
  - 5. Owner.

## 1.5 REPORTS

- A. Submit reports as required herein and conduct and interpret tests and inspections.
- B. Testing and Inspection Report: Submit test and inspection reports including the following information:
  - 1. Date issued.
  - 2. Project title and number.
  - 3. Store number.
  - 4. Firm name and address.
  - 5. Name and signature of tester or inspector.
  - 6. Name and seal of registered engineer in responsible charge (as applicable).
  - 7. Date and time of sampling.
  - 8. Date of test or inspection.
  - 9. Identification of product and specification section.
  - 10. Location in project, including elevations, grid location and detail.
  - 11. Type of test or inspections.
  - 12. Results of tests or inspections and interpretation of same.
  - 13. Observations regarding compliance with Contract Documents or deviations therefrom.
- C. Submit a separate final signed report stating whether the work requiring inspection is, to the best of the inspector's knowledge, in conformance with the approved plans, specifications, and the applicable workmanship provisions of the building code.
- D. Reports shall be made on 8-1/2 by 11 white paper, suitable for photocopying and binding in booklet form. Sheets shall have the CTL letterhead (including phone number and address). Larger sheets shall be folded and bound into the booklet.
- E. Tests and inspections reports indicating non-conformance (deviations) to the Contract Documents shall be brought to the attention of the A/E within 24 hours upon discovery.
- F. Contractor shall send an RFI to the A/E on the same day of non-conformance (deviation) notification.

## PART 2 - PRODUCTS

Not Used.

## PART 3 - EXECUTION

### 3.1 QUALITY CONTROL

- A. Quality control shall be the responsibility of the Contractor.
- B. The Owner will perform testing and inspection (T & I) but only as a means of verification to the Owner of Contractor quality control performance. Owner T & I shall not be considered Quality Control or Quality Assurance as defined herein. Owner T & I and Contractor obligations with respect to Quality Control shall be pursuant to related provisions of Articles 2.3.3, 2.3.4, 2.4.1, 2.5.2, 2.6.2, and 3.2.2 of the Construction Contract between Walmart and



Contractor.

1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
  2. Costs for retesting and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
- C. T & I by the Owner will be conducted by the Owner's Construction Testing Laboratory at no cost to the Contractor in accordance with Appendix B except that costs for failing tests will be deducted from the sum due to the Contractor.
- D. Owner T & I results and reports will be available as information to Contractor.
- E. Owner's T & I shall not be relied on by the Contractor as an indication of conformance or nonconformance of work nor shall the Contractor be dependent on the Owner's CTL test results for verification of satisfactory work in place.
- F. Work found by the Owner's CTL to be defective or in non-compliance with Contract Documents shall be corrected based on the CTL T&I results except when proven otherwise by subsequent CTL or Contractor conducted tests.
- G. In-place work will be subject to testing and inspection by the Owner's CTL at any time during the progress of the work.
- H. Test reports conducted by and at the discretion of the Contractor shall be provided to the Owner upon request when reason exists to suspect non-compliance or when used for comparison to CTL conducted tests.
- I. Any testing agency, if employed by the Contractor for purposes of Contractor Quality Control, shall not be the same entity engaged by the Owner.
- J. Contractor shall pay for:
1. Tests and inspections at the source or prior to incorporation into the Work of materials, products, or equipment to certify compliance with Contract Documents.
  2. Tests, samples, inspection, or engineering services the Contractor determines appropriate for performance of Work or for Contractor's convenience.
  3. Tests and inspections when initial tests or inspections indicate Work does not comply with Contract Documents.
  4. Tests and inspections required or conducted by public authorities as part of permits or inspection fees.
  5. Other tests and inspections indicated to be "by Contractor."
- K. Provide incidental labor and facilities to provide access to Work to be tested, to obtain and handle samples at the site or at source of products to be tested, to facilitate tests and inspections, and to provide storage and curing of test samples. Provide lift equipment as required for inspection personnel of the Owner or the Owner's representatives.
- L. Provide 14 days written notice to A/E prior to expected time for operations requiring observation, inspecting, and testing. If work to be observed is covered prior to notification, uncover work as required.
- M. Notify in writing the Owner's Construction Manager three working days prior to expected time for operations requiring inspecting and testing services.
- N. Repair and protect the work regardless of assignment of responsibility for inspection, testing, or similar services.
1. Protect work exposed by or for quality assurance and quality control service activities.
  2. Upon completion of inspection, testing, sample-taking, and similar services, restore constructed areas to conform to Contract Documents.
- O. Costs, including without limitation additional professional fees and expenses, of any required redesign or re-engineering required by non-conforming tests and inspections will be deducted from the sum due to the Contractor.
- P. Provide a Letter of Conformance at the completion of the Project to the Owner's Construction Manager, with copy to the AOR, stipulating that the Project has been built per the Contract Documents. An example is attached at the

end of this Section.

- Q. Maintain a copy of Contract Drawings and Specifications with all Addenda and Change Orders in Owner's online construction management system *Wrike*. Use the Contract Documents supplemented by the approved shop drawings and applicable material and workmanship provisions of the Code for testing and inspection of the work.
- R. Provide qualified personnel at site to comply with schedule and submit reports for each test and inspection as defined in Part 3 of this Section.
- S. Perform specified inspection, sampling, and testing of products in accordance with specified standards.
- T. Ascertain compliance of materials and mixes with requirements of Contract Documents.
- U. Perform testing and inspection in a timely manner to avoid delay of work.
- V. Notify Owner's Construction Manager and CEC or AOR, as applicable of observed non-conformance of Work or Products. If observed deviations from the Contract Drawings, Specifications, or building code will be probable cause of subsequent rejection of work or material, notify the Owner's Construction Manager and, CEC or AOR sufficiently in advance for determination to continue operations or take corrective measures before continuing.
- W. Deviations from the Contract Documents will be entered into Owner's online construction management system by other parties performing Quality Control construction observation. The Contractor shall track deviations, as defined above, and resolutions and remedial repairs to deviations and subsequent conformance to the Contract Documents in Owner's online construction management system.
- X. The Owner's Construction Manager in conjunction with the CTL and/or SI will determine when to involve the AOR or EOR for remedial action.
- Y. If additional A/E site or FPT visits are required beyond those described in Section 01454 as determined by Owner to determine correction to non-conforming work, the Contractor shall reimburse the Owner the sum of \$5000 for each additional visit to cover A/E expenses. Additional A/E site observations or FPTs will be performed as required until all deviations have been corrected by the Contractor and closed by the A/E consultant.
- Z. If ITBA retesting visits are required as described in Appendix B (Section 01455) as determined by Owner to determine correction to non-conforming work, the Contractor shall pay to ITBA the sum of \$6500 for each retesting visit to cover ITBA expenses. ITBA retesting visits will be performed as required until all deviations have been corrected by the Contractor and closed by the ITBA and/or A/E consultant.
- AA. Cooperate with CTL/SI personnel and provide access to the Work and to Contractor's facilities.
- BB. Submit test and inspection reports to the A/E consultant and other designated persons as specified in individual sections. Submit test and inspection reports to the Building Official as required.
- CC. Testing and inspection by the Building Official does not preclude the normal field involvement and site observations by the A/E consultant, nor shall it relieve the Contractor of any responsibility to complete the work in accordance with the approved drawings and specifications.
- DD. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 1 Section "Submittal Procedures."

### 3.2 PRODUCTION TESTING

- A. General Requirements:
  - 1. Testing shall be conducted as specified in the individual specification sections.
  - 2. If inspection of fabricators work is required, the Owner's representative may require testing and inspection of the work at the plant, before shipment. Owner, Architect, and Structural Engineer of Record (SER) reserve

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- the right to reject material not complying with the Contract Documents.
3. Testing and inspection shall be performed in accordance with the industry standard used as the reference for the specific material or procedure unless other criteria are specified. In the absence of a referenced standard, tests shall be accomplished in accordance with generally accepted industry standards.
  4. Work shall be checked as it progresses, but failure to detect any defective work or materials shall in no way prevent later rejection if defective work or materials are discovered, nor shall it obligate Owner to accept such work.

END OF SECTION

[Example Conformance Letter from Contractor. Edit text in parentheses for each project.]

[Date]

[Mr. Construction Manager]  
Walmart Construction  
2608 SE J ST  
Bentonville, Arkansas 72716

[Re: Supercenter (Store #xxx) – City, State]

[Dear Construction Manager:]

The purpose of this letter is to state to Walmart Inc. that, to the best of our knowledge, the construction on the above referenced project has been completed in substantial conformance with the approved Contract Documents.

We performed construction testing, observation, and testing as required by the Contract Document. To our knowledge, no outstanding items exist except as may be otherwise entered and shown on the Owner's Observation Log.

Sincerely,

[GENERAL CONTRACTOR ]  
[Include signature and date of signature]

cc:  
File  
[ARCHITECT OF RECORD]  
[ENGINEER OF RECORD]

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## SECTION 01454 - ARCHITECT-ENGINEER QUALITY ASSURANCE

## PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes:
1. Quality assurance site observation of construction by Architect and Engineers of Record.
- B. Related Requirements: The following list is intended to aid in locating work related to or dependent on the scope of Work in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
1. General Conditions: Inspections, testing, and approvals required by public authorities.
  2. Section 01452 – Contractor Quality Control: Administrative and procedural requirements for Contractor quality assurance and quality control.
  3. Appendix B – Testing, Inspection and Observation by Owner
    - a. Site observation by Architect-Engineer.
    - b. Civil Engineering Consultant Site Observation: Site observation by Owner's Civil Engineering Consultant.
    - c. Construction Laboratory Testing Services: Testing and Inspection by Owner's Construction Testing Laboratory (CTL) and services.

## 1.2 SELECTION AND PAYMENT

- A. Employment and payment for services of Architects and Engineers to perform specified site observation of construction will be by Owner.

## 1.3 CONTRACTOR RESPONSIBILITIES

- A. The Contractor shall:
1. Cooperate with A/E personnel and provide access to the Work and to Contractor's facilities.
  2. Provide incidental labor and facilities to provide access to Work to facilitate observation and testing. Provide lift equipment as required for A/E personnel.
  3. Provide A/E 14 day's written notice prior to expected time for activities requiring observation and FPT services.
  4. Maintain a copy of Contract Drawings and Specifications in Owner's online construction management system *Wrike* with all Addenda and Change Orders supplemented by the approved shop drawings and applicable material and workmanship provisions of the Code for use by the A/E.
  5. Monitor deviations from the Contract Drawings and Specifications as reported by the AOR/EOR in Owner's online construction management system *Wrike*, and resolve by subsequent conformance to documents and approvals reached through the CM deviation resolution process.

## PART 2 - PRODUCTS

Not Used.

## PART 3 - EXECUTION

## 3.1 SITE OBSERVATION

- A. Site observation by Owner's Architects and Engineers is specified in Appendix B.

END OF SECTION

## SECTION 01455 – MECHANICAL EQUIPMENT TESTING, ADJUSTING, AND BALANCING

## PART 1 - GENERAL

## 1.1 SUMMARY

## A. Section Includes:

1. Administrative and procedural requirements for test and balance services for mechanical equipment.

## B. Related Requirements:

1. Section 13810 – Building Automation System (BAS).
2. Section 15600 - Refrigeration Systems.
3. Section 15700 - Heating, Ventilating, and Air Conditioning Equipment: HVAC system equipment.
4. Section 15800 - Air Distribution: HVAC system ductwork and diffusers.
5. Appendix B – Testing, Inspection, and Observation by Owner:
  - a. Architect-Engineer Site Observation: Site observation by Owner’s Architect and Engineer Consultants.
  - b. Civil Engineering Consultant Site Observation: Site observation by Owner’s Civil Engineering Consultant.
  - c. Owner furnished Construction Laboratory (CTL) tests and inspections.

## 1.2 SELECTION AND PAYMENT

- A. Employment and payment for services of an Independent Test and Balance Agency (ITBA) to perform specified testing and balancing of environmental systems will be by Owner as specified in Appendix B (Section 01455).

## 1.3 RESPONSIBILITIES

## A. Owner Responsibilities:

1. Owner will obtain the services of an Independent Test and Balance Agency (ITBA) certified by National Environmental Balancing Bureau (NEBB) or Associated Air Balance Council (AABC).
2. Upon completion of final system Test and Balance, a copy of ITBA report will be uploaded to Owner’s online construction management system *Wrike* for the Contractor and Engineer of Record (EOR). If mechanical system deficiencies exist, those deficiencies will be listed in Owner’s online construction management system *Wrike* for the Contractor’s correction. If the Contractor fails to respond and correct these deficiencies within seven days, the Owner will authorize repairs as judged necessary and take necessary contractual action to recover adequate compensation for repair expenses.

## B. Contractor Responsibilities

1. Provide balancing dampers as specified and shown on the Drawings for proper balancing of systems.
2. Prepare system for test and balance as follows:
  - a. Install and adjust mechanical systems and have fully operational with deficiencies corrected two weeks prior to Owner Possession Date. Mechanical systems include roof top units (RTU), water source heat pumps (WSHP), air handling units (AHU), pump package, fluid coolers, chillers, exhaust fans, and associated equipment and piping.
  - b. One day prior to starting test and balance procedure, provide new filters equal in quality to factory installed filters with MERV rating as noted on equipment schedule. Filters: UL Class 1 radial pleat design with 15 pleats per linear foot.
  - c. Verify that duct work is clean and sealed tight against leaks.
  - d. Verify that controls, dampers, and actuators are installed, adjusted, calibrated, and accessible.
  - e. Prior to starting test and balance, clean and flush piping for condenser water loop per specifications.
  - f. Remove start-up strainers and clean equipment strainers after system flush is complete.

- g. To maintain schedules and prevent return trips, have experienced personnel available to correct mechanical system deficiencies while ITBA is on site.
  - h. Secure control dampers after test and balance as directed by ITBA.
  - i. Provide access to equipment and specialties required to carry out the ITBA work including providing the following:
    - 1) Access panels
    - 2) Ladders and lifts.
    - 3) Personnel to assist with access as needed.
3. When mechanical systems are ready for test and balance, notify Owner's Construction Manager and ITBA a minimum of two weeks prior to Possession Date.

#### 1.4 CONTRACTOR AND ITBA COORDINATION AND SCHEDULING

- A. Coordination and scheduling between the Contractor and ITBA shall be as follows:
- 1. Contractor shall contact the ITBA two weeks prior to the date requested for the ITBA's performance of the test and balance. Contractor shall verify contact information for the ITBA in Owner's online realty construction application.
  - 2. The Contractor shall have the mechanical systems ready for the ITBA visit at least two weeks prior to Owner Possession Date.
  - 3. Two weeks prior to the ITBA visit, the Contractor shall send the ITBA the completed Test and Balance Scheduling Form, signed by Contractor. Any exceptions to the list shall be noted and reviewed with the ITBA for possible schedule changes. The Test and Balance Scheduling Form is included in the project Issue Escalations and Communications/Mechanical Construction Communications folder in *Wrike*.
  - 4. Upon arrival at the project, the ITBA will meet with the Contractor and the mechanical and electrical sub-contractors to review the project and verify all equipment is installed and operating.

#### 1.5 CORRECTION OF DEFICIENCIES

- A. Initial ITBA Visit:
- 1. Each day the ITBA is on site, noted deficiencies will be provided to the Contractor in a list format for correction.
  - 2. The Contractor will sign the list to acknowledge its receipt.
  - 3. The Contractor will sign off on each listed item as it is corrected and submit the list to the ITBA when all items are corrected.
- B. Return ITBA Visits:
- 1. If the items cannot be completed prior to the departure of the ITBA, a return visit will be made to verify the completion of the list and finalize the ITBA work.
  - 2. Should a return trip be necessary, the Contractor will forward the completed, signed off deficiency list to the ITBA and schedule a return visit.
  - 3. The Contractor will have the sub-contractors present for the return visit.
  - 4. One return visit for deficiencies is included in the ITBA scope of work. Additional visits are considered retesting.

#### 1.6 RETESTING

- A. If the ITBA is unable to complete its work after the initial and return visits due to Contractor's non-conformance, Contractor shall be responsible for covering all expenses at current rates for ITBA's repeat testing visits until all deficiencies are corrected. ITBA will not schedule retesting visit until payment is received from Contractor.
- B. Retesting shall follow the procedures for correction of deficiencies described in Appendix B.

#### PART 2 - PRODUCTS

Not Used.

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PART 3 - EXECUTION

Not Used.

END OF SECTION

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## PRE TEST & BALANCE CHECKLIST

This pre test and balance checklist will be provided to the Contractor by the ITBA prior to the initial test and balance visit. Each mechanical subcontractor, as applicable, will verify and initial each item and return the checklist to the General Contractor. The General Contractor will fax the checklist to the ITBA to confirm readiness.

	Yes	No	Initials	Comments
All equipment is running (Field Verify)				
Ductwork is complete				
Balancing dampers are installed and wide open				
Grilles, registers, diffusers are installed				
Power and/or gas to all RTUs				
Filters are clean				
Exhaust fans and hood fans are running				
Grease filters are installed in exhaust hoods				
HVAC Units – Start-up completed by OEM				
Exhaust/Relief fan – Rotation/Operation confirmed				
Fluid cooler – Start-up completed by OEM				
Pump package – Start-up completed				
Start-up strainers have been removed from equipment				
Strainers in condenser water and refig loops have been cleaned				
Glycol has been added to the condenser and refrigeration loops				
Glycol fluid temperatures are running at design conditions				
Glycol freeze point has been verified with refractometer				
Are the HVACR systems complete, fully functional and ready for testing and balancing?				

*I CERTIFY THAT THE ABOVE ITEMS HAVE BEEN CHECKED AND THAT THE SYSTEMS ARE READY FOR TESTING AND BALANCING*

\_\_\_\_\_  
 Sub-Contractor Company Name      Date      Sub-Contractor Signature      Sub-Contractor Printed Name

**INDEPENDENT TEST AND BALANCE AGENCY:** \_\_\_\_\_

ITBA Contact Person \_\_\_\_\_ Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

## PROJECT INFORMATION WORKSHEET

This worksheet will be provided to the Contractor by the ITBA prior to the initial test and balance visit. The Contractor will complete the worksheet and fax to the ITBA prior to initial visit.

Store No. \_\_\_\_\_ Sq. Ft. \_\_\_\_\_

Store Location: \_\_\_\_\_  
\_\_\_\_\_

Possession Date: \_\_\_\_\_ Grand Opening Date: \_\_\_\_\_

Supercenter  Walmart  Market

New  Expansion  Relocation  Takeover

Roof Top Unit Manufacturer: Carrier  Aeon  Lennox

Air Handling Unit Manufacturer: Munters  Seasons-4

**GENERAL CONTRACTOR:** \_\_\_\_\_

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

Project Mgr.: \_\_\_\_\_ Phone: \_\_\_\_\_

Email: \_\_\_\_\_ Fax: \_\_\_\_\_

Website: \_\_\_\_\_

**CONSTRUCTION SITE SUPERVISOR:** \_\_\_\_\_

Jobsite Phone: \_\_\_\_\_ Fax: \_\_\_\_\_ Cell: \_\_\_\_\_

**MECHANICAL CONTRACTOR:** \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

**ELECTRICAL CONTRACTOR:** \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

**OWNER CONSTRUCTION MANAGER:** \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

**OWNER MECHANICAL SERVICES:**

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

-----  
**INDEPENDENT TEST AND BALANCE AGENCY:** \_\_\_\_\_

ITBA Contact Person \_\_\_\_\_ Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

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## SECTION 01457 - TESTING AND INSPECTION BY OWNER

## PART 1 GENERAL

## 1.1 SUMMARY

## A. Section Includes:

1. Administrative and procedural requirements for Owner furnished testing and inspection services.

## B. Related Requirements:

1. Construction Contract Between Walmart and Contractor: Inspections, testing, and approvals required by public authorities. Contractor obligations to perform work in accordance with Contract Documents.
2. Section 01452 – Contractor Quality Control: Administrative and procedural requirements for Contractor quality assurance and quality control.
3. Section 01770 - Contract Closeout: Project Record Documents.
4. Appendix B - Testing, Inspection, and Observation by Owner:
  - a. Architect-Engineer Site Observation: Site observation by Owner's Architect and Engineer Consultants.
  - b. Civil Engineering Consultant Site Observation: Site observation by Owner's Civil Engineering Consultant.
  - c. Owner furnished Construction Laboratory (CTL) tests and inspections.
5. Section 13900 – Fire Suppression – Fire Sprinkler Site Observation and Acceptance Test (FPAT).

## C. General requirements for testing and inspection to be performed by the Contractor is specified in Section 01452.

## 1.2 OWNER RESPONSIBILITIES

- A. Employment and payment for services of an Construction Testing Laboratory (CTL) and/or Special Inspector (SI) to perform specified testing and inspecting will be by the Owner under separate contract except for specified testing required to be selected and paid for by the Contractor as may be required by individual specification sections.

## 1.3 CONTRACTOR RESPONSIBILITIES

- A. Cooperate with CTL/SI personnel, and provide access to the Work and to manufacturer's facilities.
- B. Provide incidental labor and facilities to provide access to Work to be tested, to obtain and handle samples at the site or at source of products to be tested, to facilitate tests and inspections, and to provide storage and curing of test samples. Provide lift equipment as required for inspection personnel of the Owner or the Owner's representatives.
- C. Provide CTL 24 hour notice prior to expected time for operations requiring inspecting and testing services.
- D. Provide the CTL/SI with internet access and login credentials to the the Owner's Observation Log on the Building Portal website.

## PART 2 PRODUCTS

Not Used.

## PART 3 EXECUTION

Not Used.

END OF SECTION

## SECTION 01500 -TEMPORARY FACILITIES AND CONTROLS

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
1. Temporary Utilities: Electricity, lighting, heat, ventilation, telephone service, water, and sanitary facilities.
  2. Temporary Controls: Barriers, enclosures and fencing, signage protection of the Work, and water control.
  3. Construction Facilities: All-weather access roads, parking, progress cleaning, temporary buildings, and staging areas.
- B. Related Requirements: The following list is intended to aid in locating work related to or dependent on the scope of Work in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
1. Section 01351 – Regulatory Compliance:
  2. Section 01550 – Tension Pole Dust Barrier Systems: Temporary retractable-pole and sheeting dust barrier systems for enclosing interior dust-emitting work.

## 1.2 REFERENCES

- A. Occupational Safety and Health Administration (OSHA)
1. OSHA 1926.1153 Respirable Crystalline Silica.

## 1.3 ENVIRONMENTAL REQUIREMENTS

- A. Provide protective fencing, and safety signage.
- B. Provide enclosures for dust emitting interior work as specified herein and in Section 01550.
- C. Protect properties and water resources from contaminant damage until construction activities are complete.
- D. Do not use methods that would cause flooding, ponding, or other damage to Owner’s property or property of others.

## 1.4 STORMWATER RUNOFF CONTROL

- A. Control pollutants originating on site from demolition and construction activities.
- B. Ensure adequacy of Best Management Practice measures for controlling site pollutant discharge.
- C. Best Management Practices (BMPs): Refer to Appendix A at the end of the section for details of structural controls that may be used as BMP measures for controlling site pollutant discharge related to construction activities for this project. Site conditions or Contractor practices could make it necessary to install more structural controls than specified. Continually assess the need for additional controls and implement or adjust existing controls until the construction activities for this project are complete.
1. Review site conditions and identify discharge points and all potential areas of impact.
  2. Designate area(s) for equipment cleaning, maintenance, and repair. Coordinate location with Owner’s Construction Manager. The Contractor and subcontractors shall utilize such designated areas. Cleaning, maintenance, and repair areas shall be protected by temporary perimeter berms, shall not occur within 150 feet of any waterway, water body or wetland, and shall be located as far as practical from storm sewer inlets.
  3. Chemicals, paints, solvents, fertilizers, and other toxic materials must be stored in waterproof containers. Except during application, the containers must be kept in trucks or within storage facilities as specified herein. Runoff containing such material must be collected, removed from the site, treated, and disposed of at an approved solid waste and chemical disposal facility.
  4. Use of detergents for exterior washing is prohibited.

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5. Use products, site pollutant discharge control devices or materials for BMPs as specified and as applicable to related construction activities.

D. All BMPs must be installed and functioning, and shall be free of accumulated sediment and debris before construction begins. Maintain in place and functional throughout the duration of construction activities. No measure shall be implemented which causes flooding or ponding or in any other way causes damage to Owner's property or property belonging to others.

E. Review the site conditions as needed to identify potential areas of impact and discharge points.

F. Place BMPs as may be dictated by site conditions in order to maintain the intent of the specifications and pertinent Federal, State and local regulations and permits.

G. Water used for construction which discharges from the site must originate from a public water supply or private well approved by the State Health Department. Water used for construction that does not originate from an approved public supply must not discharge from the site without being treated in accordance with applicable local ground water dewatering permits/regulations.

H. Control substances that have the potential for polluting surface and/or groundwater by whatever means necessary in order to ensure that they do not discharge from the site.

1. Do not allow the discharge of wash wastewater to flow from cleaning processes to a storm water drain or catch basin, street, roadway, sidewalk, gutter, landscape area or any type of storm water structure.

2. Do not discharge solid materials, including building materials, from the site with storm water.

a. Collect cementitious material and paint waste from equipment cleaning in aboveground portable washout containers such as Vinyl-Con by RTC Environmental Products, (530) 589-2007, or equal as approved by Owner's Construction Manager and Authorities Having Jurisdiction.

b. Comply with the requirements of Section 01351 for collection and disposal of waste solids.

3. Recover and dispose of wash wastewater offsite at a licensed facility.

#### 1.5 TEMPORARY ELECTRICITY

A. Connect to existing power service. Owner will pay cost of electricity used. Power consumption shall not disrupt Owner's need for continuous service. Exercise measures to conserve energy.

B. Coordinate location and method of connection to existing electrical service with Owner's Construction Manager. Do not connect to electrical panels serving rack houses.

C. Provide adequate distribution equipment, wiring, and outlets to provide single-phase branch circuits for power and lighting. Provide temporary feeders to limit voltage loss to 5% overall from local utility power lines to provide electric requirements for project during construction.

#### 1.6 TEMPORARY LIGHTING

A. Provide and maintain lighting for construction operations. Provide minimum of 20 footcandles illumination for work areas.

B. Permanent building lighting may be utilized during construction.

#### 1.7 TEMPORARY HEAT

A. Provide and pay for heat devices and heat as required to maintain specified conditions for construction operations.

B. Prior to operation of permanent equipment for temporary heating purposes, verify that installation is approved for operation, equipment is lubricated and filters are in place. Provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts.

- C. Maintain minimum ambient temperature of 50 degrees F in areas where construction is in progress, unless indicated otherwise in specifications.

#### 1.8 TEMPORARY VENTILATION

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

#### 1.9 TELEPHONE SERVICE

- A. Provide, maintain and pay for telephone service to field office.

#### 1.10 TEMPORARY WATER SERVICE

- A. Connect to existing water source. Owner will pay cost of water used. Exercise measures to conserve water.

#### 1.11 TEMPORARY STORAGE CONTAINERS

- A. General Requirements:
  1. If required by Authority Having Jurisdiction, obtain all permits necessary for usage and placement of temporary storage container.
  2. Coordinate with Store Manager to locate temporary storage container as approved by Authority Having Jurisdiction, when applicable.
- B. Flooring Materials: Provide two temporary storage containers for use by Owner's Preferred Flooring Contractor specified in Section 09650/09680, one container for storage of flooring materials and accessories and one container for recycled tile.
  1. Coordinate required size of containers with Owner's Construction Manager.

#### 1.12 BARRIERS AND CONSTRUCTION TRAFFIC SAFETY

- A. Protect non-owned vehicular traffic, stored materials, site and structures from damage.
- B. Provide barriers to prevent unauthorized entry to construction areas to allow for Owner's use of site, and to protect existing facilities and adjacent properties from damage from construction operations.
- C. Provide barricades and covered walkways required by governing authorities for public rights-of-way, to allow for Owner's use of site, and for public access to existing building.
  1. Erect barricades using 1/2" plywood on 2x4 framing. Supports shall be as required to uphold barricade. Verify requirements with Owner's Construction Manager.
  2. Construct 8'-0" high unless otherwise directed by owner.
  3. Shopping carts shall not be used as barricades.
- D. When operating any motorized construction equipment in areas where customers or Walmart Associates are present, provide a spotter (or signal person) whose sole job responsibility shall be to ensure safe operation, including directing traffic and keeping area of traffic clear of people.

#### 1.13 TEMPORARY FENCING FOR CONSTRUCTION/DEMOLITION WASTE CONTAINERS

- A. General:
  1. Provide commercial grade temporary chain link fencing around general non-hazardous waste storage and sorting areas as specified in Section 01351 Supplement Par. 3.6.2 - ENVIRONMENTAL COMPLIANCE.
  2. Fencing shall be 8 feet high.
  3. Coordinate required linear feet of fencing with Owner's Construction Manager.
  4. Maintain access to fire hydrants and hose connections, emergency vehicles, and other site specific conditions as required by Authority Having Jurisdiction.
  5. Obtain permits required by AHJ for usage and placement of temporary chain link fencing.

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- B. Materials:
  1. Posts: Galvanized steel pipe. Posts shall be suitable for setting in concrete footings or driving into ground as required by local conditions.
  2. Fabric: Commercial-grade 2"-mesh chain-link fencing with full fence screening. Screening must be woven plastic cloth or plastic screening slats. No substitutions are allowed for fencing or screening material.
  3. Gates: Provide personnel and vehicle gates of the quantity and size required for functional access to waste container storage area.
    - a. Fabricate gates and screening of same material as used for fencing.
    - b. Equip with locks.
- C. Installation: Comply with manufacturer's recommendations.
  1. Post and Fabric: Set posts in concrete footings, drive posts in ground, or set in holes and backfill to accommodate local conditions. Stretch fabric taut and attach to posts.
  2. Gates: Install gates with required hardware.
- D. Removal: After use of fenced areas and waste/recycling containers by Walmart as specified in Section 01351, remove fencing and patch paving. Refer to Section 01731 for general patching requirements.

#### 1.14 TEMPORARY CONSTRUCTION FENCING

- A. Provide fence around construction area and staging area. Maintain and relocate during the sequencing of the Work. Coordinate installation and any relocation of fencing with all trades, Owner's Construction Manager and Store Manager. Comply with all regulations of Authorities Having Jurisdiction and OSHA requirements.
- B. Temporary construction fencing shall be 6'-0" high commercial-grade chain-link fencing with full fence screening. Screening must be woven plastic cloth or plastic screening slats. No substitutions are allowed for temporary construction fencing or screening material.
- C. Coordinate installation of temporary fencing with any and all existing underground utilities.
- D. Core drill paving as required and set line posts and end posts in sand. Gate posts may be set in concrete. Alternate methods of post installation are not allowed. Maintain posts plumb to within 1-inch in 6 feet at all times.
- E. Equip vehicular and pedestrian gates with locks.
- F. Remove fencing at completion of construction or phase and repair paving to match existing.

#### 1.15 WATER CONTROL

- A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
- B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.
- C. The Contractor shall at all times protect all activities of his construction, excavations, fill areas, embankments, trenches structures or building from damage from rainwater, spring water, ground water, backing up of drains, sewers and all other water encountered during his operations. He shall provide all pumps, equipment and enclosures necessary to provide adequate protection.
- D. Verify discharges from dewatering activities are allowed non-storm water discharges under applicable Federal, State and local regulations. Obtain a dewatering permit according to state and local regulations if discharges from dewatering activities are not allowed. Discharges from dewatering operations must be directed through an appropriate pollution prevention/treatment measure prior to being discharged from the site. Under no circumstances will discharges from dewatering operations be discharged directly into streams, rivers, lakes or other areas beyond the project limits.

#### 1.16 EXTERIOR ENCLOSURES

- A. Provide temporary weather-tight closure of exterior openings to provide acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification Sections, and to prevent entry of unauthorized persons.
- B. Provide access doors with locks.

#### 1.17 INTERIOR ENCLOSURES

- A. As shown on Drawings, provide sealed temporary partitions as specified herein and in Section 01550 to separate construction work areas from Owner occupied areas, to prevent penetration of dust and moisture into Owner occupied areas, and to prevent damage to existing materials and equipment.
- B. Temporary Stud Framed Barrier / Dust Partitions: Installation and removal of temporary dust partitions shall be scheduled with a minimum of 3 days prior notification to Owner's Construction Manager and/or Store Manager. Maintain temporary dust partitions to seal openings to Owner -occupied areas with closed joints and sealed edges at intersections with existing surfaces. These shall be scheduled, installed, and removed as required and directed by Owner's Construction Manager and may not be indicated on the Drawings. Install partitions prior to demolition of existing walls and maintain in dust tight condition until the completion of the new construction. It is the Contractor's responsibility to prohibit dust and debris from entering the Sales area or any Owner -occupied areas and to obtain approval from AHJ for materials/construction configuration and phasing of temporary enclosures.
  - 1. Dust Wall Partitions:
    - a. Framing: (same as Type A below).
    - b. Covering: 6 mil. clear poly sheeting (if allowed by the Authority Having Jurisdiction); otherwise use Griffolyn type 55 ASFR, anti-static, fire retardant sheeting. Overlap sheeting at joints a minimum 2'-0" and continuously tape joints. Attach sheeting from ceiling to finish floor for dustproof condition. If attachment to ceiling is impossible, light framing shall be installed with sheeting attached all around to prohibit dust penetration.
    - c. Plywood (where required): Install 1/2" C-D plywood over 6 mil poly. Install 4'x8' sheets horizontally from finish floor to bottom of roof deck. Ensure that blocking is provided behind each joint.
  - 2. Type A Partition / Dust Drape (no ceiling present):
    - a. Framing: Light gauge metal framing (refer Section 05400) or framing material approved by Authorities Having Jurisdiction (AHJ). Provide continuous 2x4 top and bottom plates and continuous bridging and bracing. Continue top plate to bottom side of roof deck.
      - 1) Walls up to 14'-0" may use 3-5/8" - 22 gauge metal studs at 24" o.c. or 2x4's at 16" o.c.
      - 2) Walls higher than 14'-0" may use 6" - 20 gauge metal studs at 24" o.c. or 2x6's at 16" o.c.
    - b. Covering: Install continuous 6 mil clear poly sheets (if allowed by the Authority Having Jurisdiction); otherwise use Griffolyn type 55 ASFR, anti-static, fire retardant sheeting. Install from finish floor to roof deck. Tape all joints. Install 1/2" C-D plywood over 6 mil poly. Install 4'x8' sheets horizontally from finish floor to bottom of roof deck. Ensure that blocking is provided behind each joint.
  - 3. Type B Partition / Dust Drape (ceiling grid to remain in place):
    - a. Framing: (same as Type A above).
    - b. Covering: Install continuous 6 mil clear poly sheets (if allowed by the Authority Having Jurisdiction); otherwise use Griffolyn type 55 ASFR, anti-static, fire retardant sheeting. Install from finish floor to roof deck. Tape all joints. Install 1/2" C-D plywood over 6 mil poly. Install 4'x8' sheets horizontally to bottom of finish ceiling. Extend 6 mil poly to bottom of roof deck. Ensure that blocking is provided behind each joint.
  - 4. Type D Security Partitions (exterior):
    - a. Framing: (same as Type A above).
    - b. Covering: At interior face of partition, install continuous 6 mil clear poly sheets (if allowed by the Authority Having Jurisdiction); otherwise use Griffolyn type 55 ASFR, anti-static, fire retardant sheeting. Install from finish floor to roof deck. Tape all joints. Install 1/2" C-D plywood over 6 mil poly. Install 4'x8' sheets horizontally to bottom of roof deck. Ensure that blocking is provided behind each joint. At exterior face of partition, install 30 gauge, 24" wide corrugated metal panels as shown on the Drawings. Fill wall cavities with R-13 batt insulation.
  - 5. Doors:



- a. Single acting doors, opening out, with sturdy closer, closing against gasketed stops on frame to reduce passage of dust.
- 6. Sealing:
  - a. Seal perimeter of partitions and doors to prevent passage of dust. At Type A and B partitions, tape fastener depressions, joints between panels and joints between panels and floors, ceiling and columns with 2 in. wide pressure sensitive tape.
- 7. Mats:
  - a. Provide mats at doors to reduce tracking of dust. Replace or clean daily.
- C. Contractor's Option: Tension Pole Dust Barrier System: Temporary retractable-pole and polyethylene sheeting dust barrier system as specified in Section 01550.
  - 1. General use: In lieu of Stud framed Dust Wall Partitions that are not adjacent to Food Areas, where a barrier to security or safety is not required.
  - 2. Emergency use (48 hours or less): Continuously attended construction area, where approved by Walmart Construction Manager.
  - 3. Access doors, walk-off mats, and system accessories as specified in Section 01550.

#### 1.18 FIELD OFFICES AND SHEDS

- A. Contractor's Office: (Not required for projects with a duration of less than 4 weeks, or as stated otherwise in Bid documents.)
  - 1. Size as required for Contractor's use and to provide space for project meetings.
  - 2. Adequate electrical power, lighting, heating, and cooling to maintain human comfort.
  - 3. Office space with desk and chair, layout table, plan rack, and facilities for storage of Project Record Documents.
  - 4. Furnishings in meeting area:
    - a. Conference table and chairs for at least eight persons.
    - b. Racks and files for Project Record Documents in, or adjacent to, the meeting area.
    - c. Other furnishings: Contractor's option.
  - 5. Contractor's office and sheds not to be used as living accommodations.
- B. Storage Sheds: Structurally sound, weathertight, on proper foundations, with floors raised above ground.
- C. Locate office and sheds minimum 30 feet from structures.

#### 1.19 CONSTRUCTION AIDS

- A. Provide construction aids required to facilitate execution of Work, including stairs, ladders, ramps, staging, platforms, railings, cranes, scaffolds, hoists, chutes, runways, and other required facilities and equipment.
- B. Such apparatus, equipment and construction shall meet requirements of applicable OSHA (Federal), State and Local Safety and Labor Laws.
- C. Store employees shall not be allowed access to scaffolds, ladders, and hoists.
- D. Coordinate crane service required for erection of structural steel, installation of HVAC Rooftop Units, and other crane services as required to accommodate Owner's needs.

#### 1.20 PROTECTION OF EXISTING WORK

- A. The existing building shall be protected from moisture, dust and debris. Install dust partitions or drapes as shown or as required to keep dust and moisture from the building premises.
- B. Provide suitable temporary watertight coverings over openings as required to protect interior work from inclement weather and related/adjacent construction areas.
- C. Maintain benchmarks, monuments and other reference point. If disturbed or destroyed, replace as directed.

- D. Protect existing adjacent streets, sidewalks, curbs, buildings and property, including trees, lawns and plants.

#### 1.21 PROTECTION OF INSTALLED WORK

- A. Protect installed Work; provide special protection where specified in individual specification Sections.
- B. Provide temporary and removable protection for installed Products. Control activity in immediate work area to minimize damage.
- C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- E. Minimize traffic and storage on roofed surfaces. If traffic or storage is necessary, obtain recommendations for protection from roofing material manufacturer.
- F. Do not operate cranes or other heavy equipment on concrete floor slabs if damage could result from such operations.
- G. Prohibit traffic from landscaped areas.

#### 1.22 SECURITY

- A. Maintain the integrity of the existing building security and security systems at all times. Provide security and facilities to protect Work and Owner's operations from unauthorized entry, vandalism, and theft.
- B. Obtain permission and coordinate with Owner's security program through Owner's Construction Manager at least 12 hours prior to the modification of any existing security system.
- C. Building Security: Certified and bonded uniformed guard service licensed in the State in which project is located to provide security guard(s) for security and facilities to protect Store facilities from unauthorized entry, vandalism and theft during performance of all work operations during Store non-operational hours.
- D. Provide continuous security at openings cut into existing exterior walls and roofs.

#### 1.23 ACCESS ROADS AND PARKING

- A. Construct and maintain temporary all weather roads accessing public thoroughfares to serve building pad and construction staging area.
- B. Extend and relocate as Work progress requires. Provide detours necessary for unimpeded traffic flow.
- C. Provide and maintain access to fire hydrants, free of obstructions.
- D. Provide temporary parking areas to accommodate construction personnel.
- E. When site space is not adequate, provide additional off- site parking.
- F. Provide 100' x 100' all weather material staging area exclusive of building pad.

#### 1.24 NOISE CONTROL

- A. Demolition and other Work that disturbs surrounding Store areas shall only be allowed in the following categories and time restrictions:
  - 1. Low Level Noise: Assembling trades such as electricians, ceiling installers, painters, tapers, etc.. Excludes all hammering and impact drilling. Low-level noise operations are allowed during Walmart Store operational hours.

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2. Moderate Level Noise: Trades include gypsum board installers, stud partition installers, duct installers, etc. Includes occasional and intermittent hammering, screw drilling, etc.. Excludes impact drilling and concrete sawing. Moderate level noise operations may be allowed during Store operational hours upon approval of Owner's Construction Manager or Store Manager.
3. High Level Noise: Constant loud and high pitched noise produced by impact drilling, concrete saw cutting, hammering of ductwork, and all demolition work. High-level noise operations shall be restricted to Walmart Store non-operational hours.

#### 1.25 PROGRESS CLEANING

- A. Refer to requirements specified in Section 01740.

#### 1.26 SIGNAGE

- A. Temporary Construction Signage: Provide temporary signage for identification as required due to obscurity caused by construction. Provide signage for traffic control and safety information. Provide temporary pavement striping for traffic control and pedestrian safety. Provide temporary handicap parking spaces if existing spaces are at a non-accessible location to the building entrance.

#### 1.27 INFORMATION/SAFETY BOARD

- A. Provide 4'x8'x3/4" C/D exterior glue plywood to be attached on the existing exterior wall at a location designated by the Owner's Construction Manager.
- B. Information/Safety Board shall be used to communicate safety, state & federal, hiring, OSHA and EPA requirements, bulletins and other information required for the construction of this Project.
- C. The board shall contain but not be limited to the following:
  1. OSHA Safety Requirements
  2. Federal and State Hiring Regulations
  3. Pertinent State, Local, and Federal Employment Regulations
  4. Building Permits
  5. Emergency telephone numbers
  6. Job Site Safety Meeting notifications
  7. EPA Permits or Notification regarding Asbestos or other Toxic or Hazardous Materials
  8. Other information required to comply with applicable OSHA, EPA and Federal safety laws
- D. Protect posted information with either plastic sleeves stapled to the board or 6 mil clear plastic sheathing over entire board providing access for posting of additional information.

#### 1.28 POSTED CONSTRUCTION SCHEDULE

- A. Post construction schedule and Phasing Plans (Floor Tile, Paint) in back office area for clear viewing by all trades and workmen. Provide names/telephone numbers of Owner's Construction Manager, General Contractor Project Manager, Superintendent and Phase I Supervisor. Maintain most recent and updated version of schedule.

#### 1.29 STORAGE OF CONSTRUCTION MATERIALS AND EQUIPMENT

- A. Locate storage areas to minimize exposure to weather. The Contractor shall inspect areas used for storing materials for evidence of, or the potential for, pollutants entering the storm drainage system or discharging from the site. If necessary, the materials must be covered, or original covers must be repaired or supplemented. Construct protective berms, if needed, in order to contain runoff from material storage areas. Comply with all state and local regulations pertaining to material storage areas.
- B. The Work area may be used to store materials and equipment as approved by the Owner's Construction Manager. Provide storage trailers as required for storage of other materials. The Contractor shall not use Owner's trailers or storage warehouses for materials/equipment storage.

1. Storage of chemicals, paints, solvents, fertilizers, and other toxic materials within building is prohibited. Remove such materials daily from store.
2. Locate storage trailers containing chemicals, paints, solvents, fertilizers, and other toxic materials a minimum of 30 feet from existing structures and adjacent property lines. Coordinate with Owner's Construction Manager if site constraints will not allow placing storage trailers at specified distance.
3. Construction equipment and vehicles shall be maintained to insure equipment and vehicles are without fluid leaks. Remove construction equipment and vehicles with fluid leaks from store site.
4. Temporary on-site fuel tanks for construction equipment shall meet all State and Federal regulations. Tanks shall have approved spill containment with the capacity required by NFPA 30 and all other applicable regulations. Generate a Spill Prevention, Control and Countermeasure (SPCC) Plan if above ground oil storage capacity at the construction site exceeds 1,320 gallons or as specified by the State in accordance with Oil Pollution Prevention regulation 40 CFR 112.

C. Hazardous Material Management and Spill Reporting Plan:

1. Properly handle any hazardous or potentially hazardous material brought onto construction site to reduce potential for stormwater pollution.
2. Store and handle flammable and combustible liquids in accordance with 29 CFR 1926.152. Use only approved containers and portable tanks for storage and handling of flammable and combustible liquids.
3. Maintain on-site all Material Safety Data Sheets (MSDS) for any and all applicable materials.
4. Maintain a spill control and containment kit on-site. Contents may typically include:
  - a. Absorbent material such as kitty litter or sawdust.
  - b. Acid neutralizing agent.
  - c. Brooms, dust pans, mops, rags.
  - d. Personal Protective Equipment (PPE): gloves, goggles, etc.
  - e. Plastic and metal trash containers.
5. Immediately contain and remove any spilled materials in the manner specified by local, State and Federal regulations and by product manufacturer.
6. Notify Owner's Construction Manager immediately in the event of a spill.
7. Report spills to appropriate agencies in accordance with local or State agency regulations as soon as possible.

D. The Work area may be used to store materials and equipment as approved by the Owner's Construction Manager. Provide storage trailers as required for storage of other materials. The Contractor shall not use Owner's trailers or storage warehouses for materials/equipment storage.

E. Storage of flammable/volatile liquid and paint materials within building is prohibited. Remove flammable materials, volatile liquids and paint daily from store.

F. The Contractor may not store materials on site except for what is in use for the current work.

G. Cover and protect material in transit.

H. Stored materials shall be available for inspection by Owner at all times.

I. Walmart is NOT responsible for the loss of any construction materials or the Contractors' loss of equipment or tools.

1.30 TEMPORARY FIRE PROTECTION

A. Contractors and sub-contractors and their agents and employees shall comply with local fire protection codes and OSHA Regulations.

1. Provide a minimum of one U.L. listed 2A:20BC dry chemical fire extinguisher, or one standard U.L. listed 2-1/2 ga. Water (E-10) and one U.L. listed 10BC carbon dioxide fire extinguisher mounted together, in each of the following areas:
  - a. Each 3000 sq. ft. of work area or fraction thereof with minimum of two extinguishers.
2. Contractor's superintendent, or other assistant superintendents, shall be appointed as project fire warden for entire construction period.

3. Train workmen in proper use of each type fire extinguisher.
4. Post telephone number of fire department, specific information on location of on-site fire fighting equipment and procedure to be followed in event of fire.
5. Maintain free access at all times to fire extinguisher equipment, street fire hydrants, and outside connections for standpipe hose systems.

B. Maintain exit facilities and access thereto free of material and other obstructions. If any exits are rendered inoperative during remodeling, provide the same number of temporary exits and maintain a sufficient number of required exits and exit width as required by the adopted building code and AHJ.

#### 1.31 NON-SMOKING POLICY

A. Smoking will not be allowed within the building or customer/associate traffic areas at any time.

#### 1.32 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary above grade or buried utilities, equipment, facilities, materials, prior to Final Walk-Thru inspection.

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

C. Restore existing facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

D. At completion of construction, remove fencing, guardrails, barricades, temporary signage and temporary coverings.

#### PART 2 - PRODUCTS

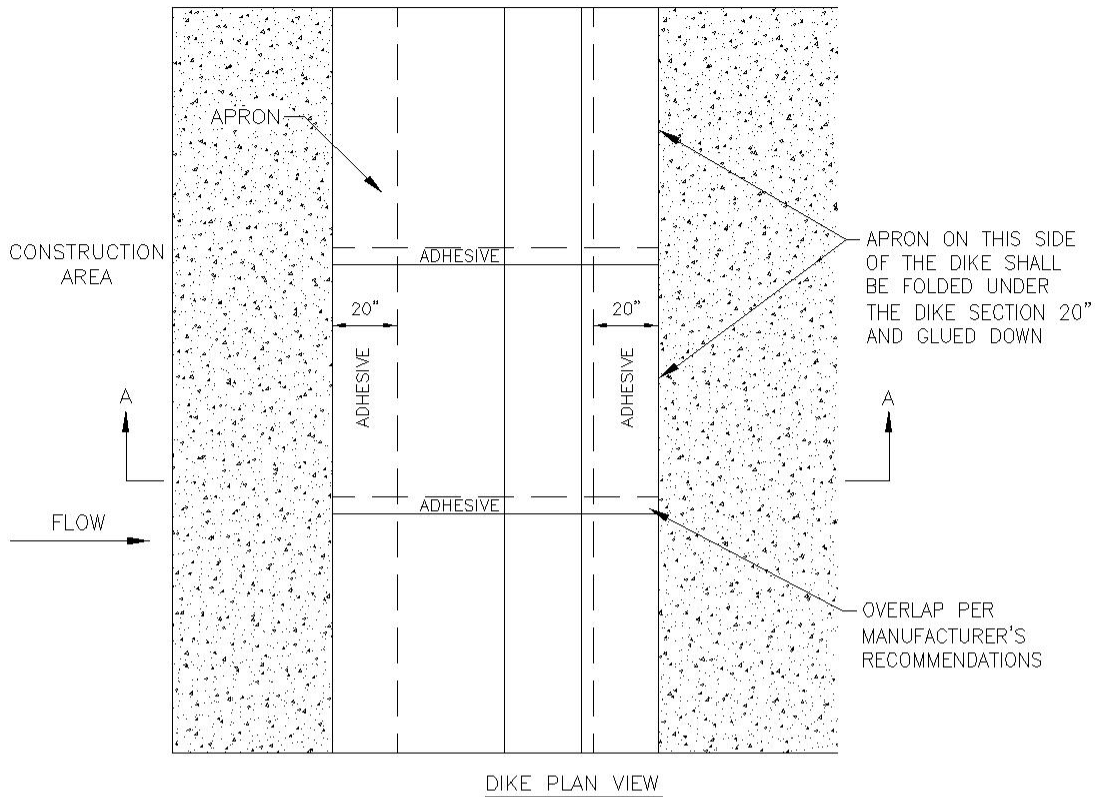
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#### PART 3 - EXECUTION

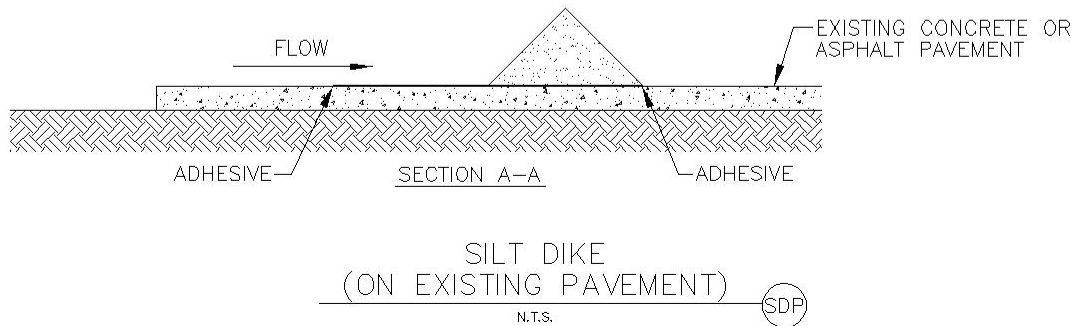
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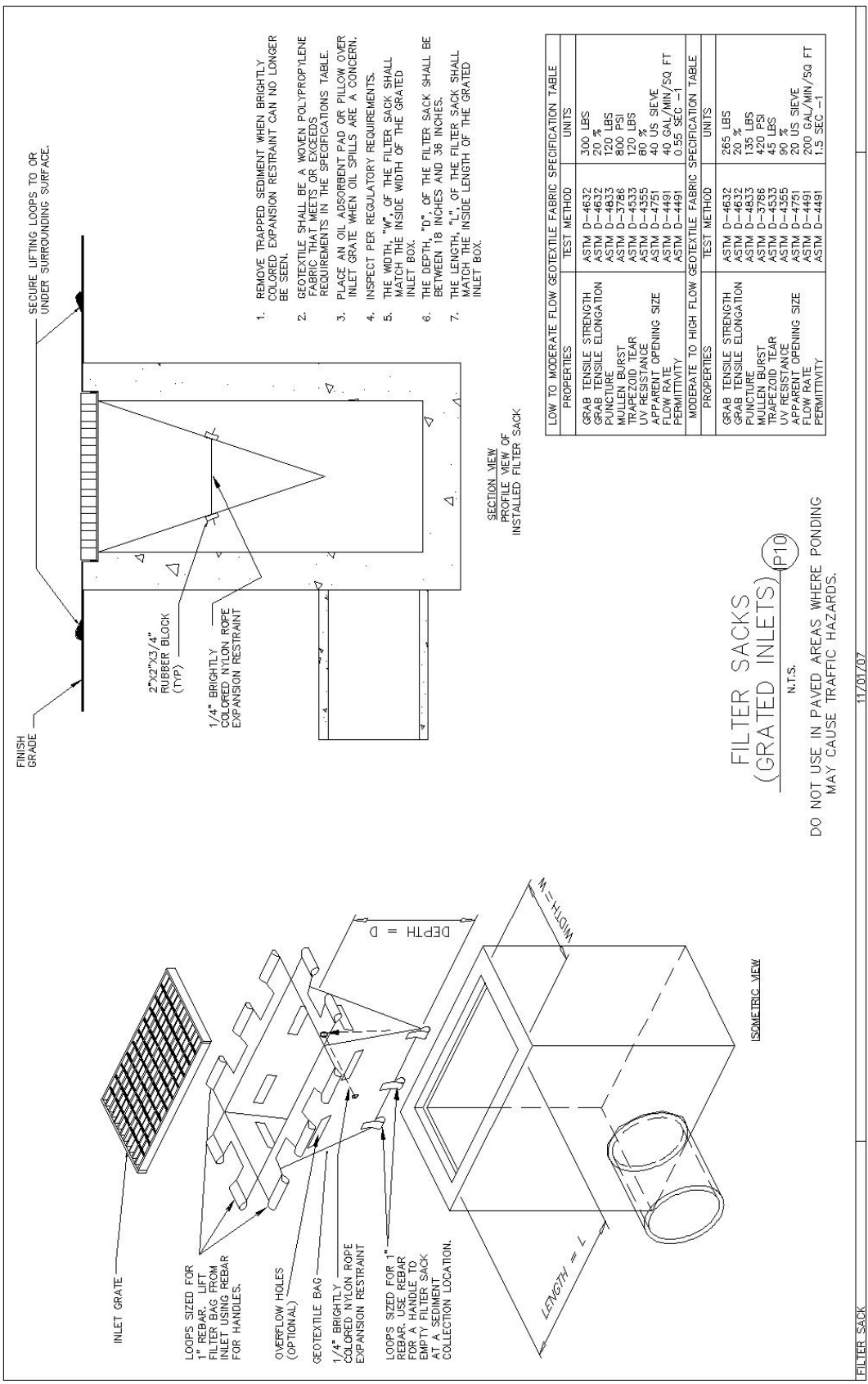
Appendix A – Site BMPs



- NOTES:
1. INSTALLED SILT DIKE UNIT SHALL HAVE CONTINUOUS AND FIRM CONTACT WITH PAVEMENT.
  2. ADHESIVES SHALL BE LIQUID NAIL OR APPROVED EQUAL FOR CONCRETE PAVEMENT APPLICATIONS AND EMULSIFIED ASPHALT FOR ASPHALT APPLICATIONS. ADHESIVE SHALL BE PLACED WHERE THE UNITS OVERLAP AND A 20" STRIP ALONG BOTH EDGES.



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1. REMOVE TRAPPED SEDIMENT WHEN BRIGHTLY COLORED EXPANSION RESTRAINT CAN NO LONGER BE SEEN.
2. GEOTEXTILE SHALL BE A WOVEN POLYPROPYLENE FABRIC THAT MEETS OR EXCEEDS REQUIREMENTS IN THE SPECIFICATIONS TABLE.
3. PLACE AN OIL ADSORBENT PAD OR PILLOW OVER INLET GRATE WHEN OIL SPILLS ARE A CONCERN.
4. INSPECT PER REGULATORY REQUIREMENTS.
5. THE WIDTH, "W", OF THE FILTER SACK SHALL MATCH THE INSIDE WIDTH OF THE GRATED INLET BOX.
6. THE DEPTH, "D", OF THE FILTER SACK SHALL BE BETWEEN 18 INCHES AND 36 INCHES.
7. THE LENGTH, "L", OF THE FILTER SACK SHALL MATCH THE INSIDE LENGTH OF THE GRATED INLET BOX.

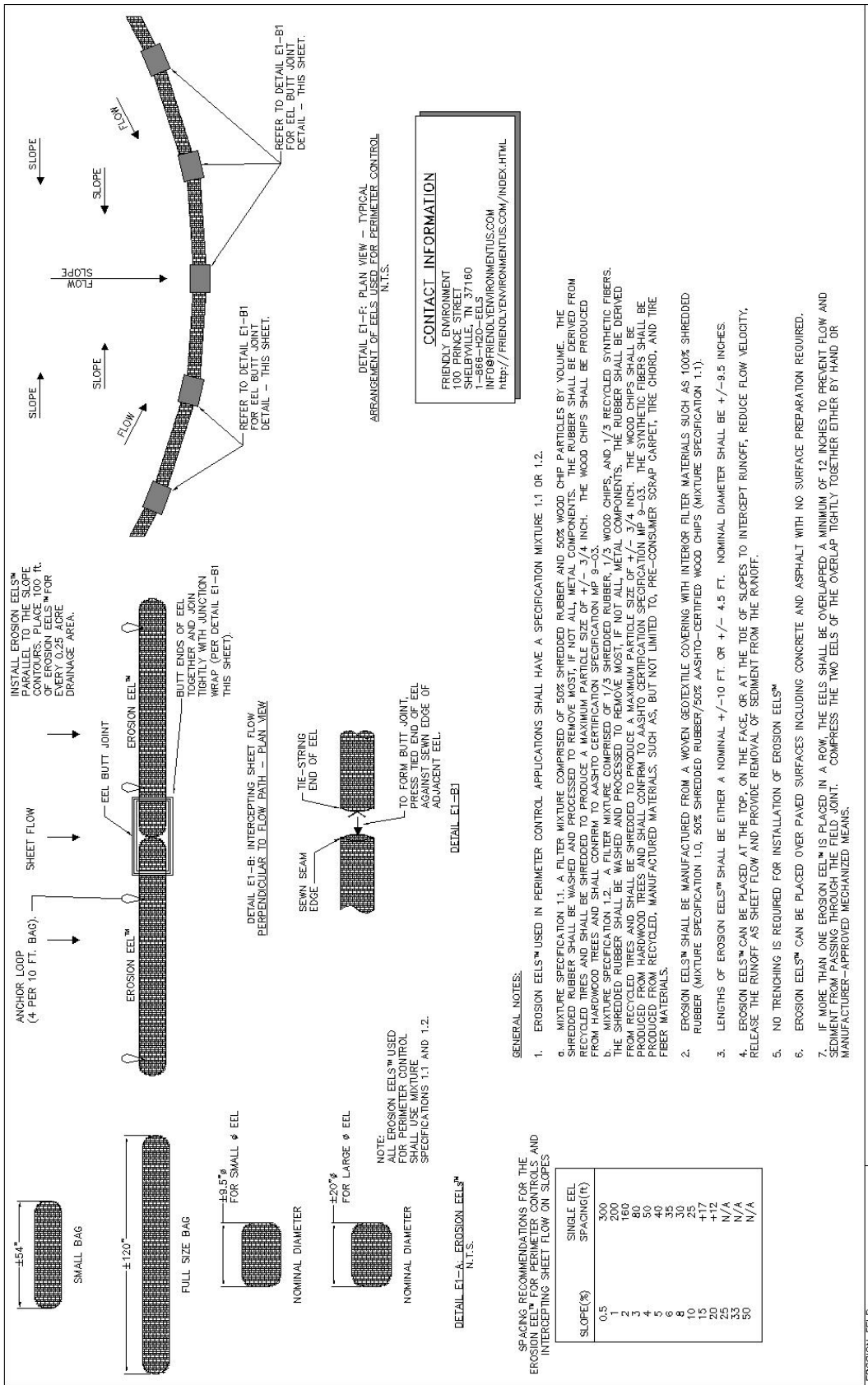
SECTION VIEW OF PROFILE VIEW OF INSTALLED FILTER SACK

LOW TO MODERATE FLOW GEOTEXTILE FABRIC SPECIFICATION TABLE		
PROPERTIES	TEST METHOD	UNITS
GRAB TENSILE STRENGTH	ASTM D-4632	300 LBS
GRAB TENSILE ELONGATION	ASTM D-4632	20 %
PUNCTURE	ASTM D-4632	120 LBS
MULLEN BURST	ASTM D-3786	800 PSI
MULLEN BURST	ASTM D-4535	70 LBS
UV RESISTANCE	ASTM D-4535	80 %
APPARENT OPENING SIZE	ASTM D-4751	40 US SIEVE
FLOW RATE	ASTM D-4491	40 GAL/MIN/SQ FT
PERMITTIVITY	ASTM D-4491	0.55 SEC -1
MODERATE TO HIGH FLOW GEOTEXTILE FABRIC SPECIFICATION TABLE		
PROPERTIES	TEST METHOD	UNITS
GRAB TENSILE STRENGTH	ASTM D-4632	265 LBS
GRAB TENSILE ELONGATION	ASTM D-4632	20 %
PUNCTURE	ASTM D-4632	120 LBS
MULLEN BURST	ASTM D-3786	420 PSI
TRAPEZOID TEAR	ASTM D-4533	45 LBS
UV RESISTANCE	ASTM D-4355	90 %
APPARENT OPENING SIZE	ASTM D-4751	20 US SIEVE
FLOW RATE	ASTM D-4491	200 GAL/MIN/SQ FT
PERMITTIVITY	ASTM D-4491	1.5 SEC -1

**FILTER SACKS  
(GRATED INLETS)** (P10)

N.T.S.  
DO NOT USE IN PAVED AREAS WHERE PONDING MAY CAUSE TRAFFIC HAZARDS.

11/2017/07





## SECTION 01550 (11 44 16) – TENSION POLE DUST BARRIER SYSTEMS

## PART 1 - GENERAL

## 1.1 SUMMARY

## A. Section Includes:

1. Temporary retractable-pole and sheeting dust barrier systems and related containment accessories for enclosing interior dust-emitting construction work. Barriers may be relocated and reused as permitted in this section.

## B. Related Requirements:

1. Section 01351 – Regulatory Compliance:
  - a. Disposal and removal of construction and universal waste.
  - b. Work practice control methods for airborne suppressing respirable dust.
2. Section 01500 – Temporary Facilities and Controls: Locations for use.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. ASTM International (ASTM):
  1. ASTM D 7948 - Test Method for Measurement of Respirable Crystalline Silica in Workplace Air by Infrared Spectrometry.
- C. Occupational Safety and Health Administration (OSHA):
  1. OSHA 29 CFR Standard 1926.1153 - Respirable Crystalline Silica: Table 1 construction control methods for suppressing airborne respirable dust and permissible exposure limit (PEL).

## 1.3 QUALITY ASSURANCE

- A. Use barrier system components and accessories recommended by the manufacturer to maintain dust emissions below the OSHA permissible level when tested in accordance with ASTM D 7948.

## 1.4 ENVIRONMENTAL REQUIREMENTS

- A. Remove personal protective equipment, protective outerwear, shoe covers, and respiratory devices used inside dust containment areas before entering clean rooms.
- B. Wet clean barrier system components and accessories frequently during use and between jobs to avoid dust transmission.
- C. Dispose of plastic sheeting and other construction waste in accordance with the requirements of Section 01351 Regulatory Compliance Supplement.

## 1.5 DELIVERY, STORAGE AND HANDLING

- A. Transport, handle, store, and protect barrier system assembly as specified in Section 01600.

## PART 2 - PRODUCTS

## 2.1 SUPPLIERS

- A. Provide products by one of the following or equivalent products subject to the requirements specified herein by another supplier:
1. [Surface Shields](#), Orland Park, IL, (708) 226-9817. Contact Tom Fergus, [tfergus@surfaceshields.com](mailto:tfergus@surfaceshields.com).
  2. [ZipWall](#), Arlington, MA, (800) 718-2255.
  3. [FastCap](#), Ferndale, WA, (888) 443-3748.
  4. [ToolLab](#), Winchester, OH, (800) 424-8251, [sales@toolab.com](mailto:sales@toolab.com)
  5. [Pro Tect Associates, Inc.](#), Northbrook, IL, (877) 991-1352, [contact@pro-TECT.com](mailto:contact@pro-TECT.com).

## 2.2 SYSTEM DESCRIPTION

- A. Adjustable Height Poles: Heavy duty spring loaded, adjustable height locking metal poles with locking header parts and non-slip rubber floor base foot, length as required.
1. [Dust Shield Pro Extendable Containment Poles](#) by Surface Shields.
  2. [Spring-Loaded Poles](#) by ZipWall.
  3. [3rd Hand Dust Barrier System](#) by FastCap.
  4. [Speedy Wall Poles](#) or [Curtain-Wall](#) Modular System by ToolLab.
  5. [EZ Prop Dust Poles](#) by Pro Tect Associates.
- B. Polyethylene Sheet Screening Material: Clear or white translucent polyethylene sheeting, tested in accordance with the requirements of NFPA for flame retardancy, 6 mil thickness. Provide sheet from suppliers specified herein or equivalent.
1. Contractor's Option: In lieu of polyethylene sheeting, the following reusable fabric panels may be used as barrier screening material:
    - a. [Zip-Fast Reusable Barrier Panels](#) by ZipWall.
- C. Sealing Access Door: Provide one of the following continuous sealing access panel components:
1. Adhesive Zipper Door: Single-use zipper strip of heavy duty polyester or HDPE fabric with pressure-sensitive adhesive backing for application to polyethylene sheet material, 7 ft long. Provide one of the following:
    - a. [Zip n Close Zippers](#) by Surface Shields.
    - b. [ZipWall Self-Adhesive Zippers](#) by ZipWall.
    - c. [Zip-Up](#) or [Curtain-Door](#) by ToolLab.
    - d. [Pro Tect Zip-Up](#) by Pro Tect.
  2. Self-Closing Magnetic Door: Reusable suspended header partition with vertical magnetic strips at access opening, 79 in long. Provide the following:
    - a. [3rd Hand Magnetic Dust Barrier Door](#) by FastCap.

## 2.3 DUST CONTAINMENT ACCESSORIES

- A. Vent, Duct, and Surface Protection Film: Self-adhering, clean removal polyethylene protective film. Provide the following or equivalent:
1. [Duct Cover Shield](#) by Surface Shields.
  2. [Vent Mask](#) by Surface Shields.
  3. [Multi Use Red Surface Protection Film](#) by Pro Tect.
- B. Clean Room Walk-Off Mat: Disposable tacky floor mats for collecting foot traffic debris, roll or premeasured sheets, with adhesive or non-skid backing.
- C. Adhesive Tape: Pressure-sensitive, medium tack, UV resistant, rated for clean release after 14 days. Minimum 5 mil thickness, 2 inch wide.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Verify dimensions on site prior to installing barrier system.

- B. Inspect supporting substrates prior to barrier system installation. Do not attach or abut dust barrier components to mobile or unsecured substrates.
- C. Coordinate barrier system installation to ensure that simultaneous work outside dust containment areas will not disturb or compromise enclosure.
- D. Cover and seal vents, ducts, and surfaces inside the containment area.

### 3.2 INSTALLATION

- A. Install dust barrier systems prior demolition, disposal, cutting, patching, or cleaning work as described in Division 1 specifications. Install dust barrier systems prior to cutting, patching, sawing, drilling, and coring as described in Divisions 3, 4, and 5 specifications.
- B. Provide the number of components and accessories as required to create a continuous seal between the dust containment area and the clean room.
- C. Install dust barrier system components in accordance with manufacturer's published instructions. Attach extension poles from ceiling to finish floor. Where attachment to ceiling is impractical, install light framing with sheeting secured on top and all sides. Draw plastic sheeting taut without gapping, wrinkling, or puddling at floor.
- D. Do not allow joints in plastic sheeting between poles.
- E. Do not reuse plastic sheeting for subsequent work sites.
- F. Use adhesive tape at corners, sheeting joints, and as necessary to reinforce the seal in areas of the enclosure receiving heavy traffic or tension. Do not use tape as a substitute for extension poles or zipper access doors to seal the barrier enclosure.
- G. Locate walk-off mats at foot traffic transitions between dust containment area and clean rooms.

END OF SECTION

## SECTION 01600 - PRODUCT REQUIREMENTS

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Basic Product Requirements.
  - 2. Product Options.
  - 3. Product Substitution Requirements.
  - 4. Direct Purchase Products.
  - 5. Product Delivery Requirements.
  - 6. Product Storage and Handling Requirements.
  - 7. Product Lead Time Schedules.
  
- B. Related Requirements: The following list is intended to aid in locating products and work related to or dependent on the scope in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
  - 1. Products and Work by Owner or Separate Contractor: Manufacturers, suppliers, product information, installation (if applicable), and general procedures related to Owner furnished products.

## 1.2 DEFINITIONS

- A. Products: Defined as new material, machinery, components, equipment, fixtures, and systems forming the Work. Does not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work. Products may also include existing materials or components required for reuse.

## 1.3 BASIC PRODUCT REQUIREMENTS

- A. For products or workmanship specified by association, trade, or other consensus 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 by date of issue current on date of Contract Documents.
- C. Obtain copies of standards when required by Contract Documents.
- D. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.
- E. The contractual relationship, duties, and responsibilities of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

## 1.4 PRODUCT OPTIONS

- A. Products Specified by Naming a Single Manufacturer and/or Model Number: Provide specified product only unless otherwise specifically permitted in the specifications.
- B. Products Specified by Naming Two or More Manufacturers: Provide specified products of manufacturers and models named only, meeting specifications and specified requirements unless otherwise specifically permitted in the specifications.

- C. Products Specified by Reference Standards or by Description Only: Provide any product meeting specified reference standard or description.

#### 1.5 PRODUCT SUBSTITUTION REQUIREMENTS

- A. No substitutions permitted. Provide specified products only unless otherwise specified.

#### 1.6 DIRECT PURCHASE PRODUCTS

- A. Direct purchase products shall be purchased directly by the General Contractor from the Manufacturer or the Pre-Negotiated Supplier as specified in the individual Specifications Sections. Direct purchased products shall not be purchased by any subcontractor regardless of the discipline or subcontract involved in the installation.

#### 1.7 SCHEDULING AND COORDINATION - GENERAL

- A. Lead times and negotiated suppliers for higher volume items are provided in the Product Lead Time Schedule included in Part 3 of this Section.

#### 1.8 PRODUCT DELIVERY REQUIREMENTS

- A. Transport and handle products in accordance with manufacturer's instructions. Deliver materials and equipment at such stages of work in order to expedite the Work and minimize storage requirements.
- B. Schedule delivery for Owner furnished and installed equipment such that upon delivery of equipment to the site, sufficient equipment provisions are in place ready for installation and hook-up.
- C. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.
- D. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, and damage. Do not use damaged materials and equipment.

#### 1.9 OWNER FURNISHED PRODUCT DELIVERY REQUIREMENTS

- A. Product Delivery and Receiving:
  - 1. Unless noted otherwise herein, Owner's supplier will deliver products and equipment to jobsite for Contractor to receive on delivery date established by Contractor.
  - 2. Terms of Contractor's delivery and receiving, as well as significant order lead times required for some products, are specified in the Delivery Schedules included herein.
  - 3. The Schedules provide summary information only and do not preclude or supersede requirements contained in the corresponding individual sections or in Appendix A or the Drawings.
- B. Coordination:
  - 1. Contractor shall contact [ym-potracksupport@lumatrak.com](mailto:ym-potracksupport@lumatrak.com) immediately after Award of Contract to initiate registration in the GC Communicator (GCC) program for Owner supplier scheduling and coordination.
  - 2. Owner's Supplier and Contractor shall establish product delivery and installation dates, quantities of materials, and a coordination procedure through the GCC program.
  - 3. Exceptions to Contractor scheduling are specified in the Delivery Schedules included herein.
- C. Refer to the applicable drawings or Appendix A for specific details regarding Owner furnished products or equipment.

- D. Receive and unload products at the Site unless otherwise specified in the Owner Products Delivery Exceptions Schedules included herein.
- E. Owner Furnished and Installed Equipment to be Received by the Contractor.
  - 1. Owner furnished and installed equipment will be received at the site by the Owner except the following, which shall be received by the Contractor.
- F. Review supplier furnished shop drawings, product data, and samples under provisions of Specifications Section 01330. Submit to supplier with notification to Architect, Owner, and Owner's Construction Department of any discrepancies or problems anticipated in the use the products.
- G. Verify quantity of products furnished with shop drawings, Final Field Use Drawings, or Bills of Lading as applicable.
- H. Promptly inspect products upon receipt for shortages, damaged, or defective items; report to Owner and Owner's Construction Department. Upon notification, Owner will arrange for delivery of replacement products.
- I. Report suspected product manufacturing defects to Owner's Construction Manager and Product Supplier. Upon notification, Owner will arrange for repair of product manufacturing defects.

#### 1.10 PRODUCT STORAGE AND HANDLING REQUIREMENTS

- A. Provide safe storage of products.
- B. Store and protect products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather-tight, climate controlled enclosures.
- C. For exterior storage of fabricated products, place on sloped supports, above ground.
- D. Provide off-site storage and protection when site does not permit on-site storage or protection.
- E. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation.
- F. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- G. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- H. Arrange storage of products to permit access for inspection. Periodically inspect to assure products are undamaged and are maintained under specified conditions.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Provide interchangeable components of the same manufacturer, for components being replaced.
- B. Do not use materials and equipment removed from existing premises, except as specifically permitted by the Contract Documents.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION OF OWNER FURNISHED PRODUCTS

- A. Owner Furnished Equipment Installed by the Contractor. All Owner Furnished equipment shall be installed by the Contractor unless otherwise noted in the individual sections of the Specifications, on the Drawings, or in Appendix A to be installed by the Owner.
- B. Provide for installation and hook-up at time of delivery of Owner installed equipment if Owner is to install as specified in the Products Installed by Owner Schedules included herein.
- C. Install in accordance with manufacturer's instructions.
- D. Coordinate installation of Owner installed products and equipment.
- E. Work in harmony with all subcontractors, suppliers and manufacturers.
- F. Unpack and set in place, plumb, level, and secure.
- G. Connect to mechanical, plumbing, and electrical systems as required.
- H. Remove packaging and clean products.
- I. Test and adjust as required.
- J. Replace items damaged during installation.
- K. Protect installed products from damage by subsequent construction operations.

3.2 PRODUCT LEAD TIME REQUIREMENTS AND SCHEDULE

- A. The Product Lead Time Schedule is included to assist the Contractor in scheduling timely delivery of higher volume items in the current program. The Schedule is not an inclusive list of the scope of any particular project and does not replace requirements in other Contract Documents.
- B. Allow a minimum duration between order and expected shipment date of products and equipment as provided in the Schedule. Ordering immediately after award of bid or at any time ahead of the minimum duration provided herein is encouraged.
- C. Additional costs for expedited transport, substituted equipment, or scheduling delays which result from failure to submit timely orders shall be at Contractor's expense with no cost to the Owner.
- D. Equipment for atypical applications may require a longer duration.
  - 1. Immediately after award of contract, identify project conditions requiring equipment that varies from prototypical size, composition, or nature of use. Submit order for atypical equipment as soon as conditions are suspected.

PRODUCT LEAD TIME SCHEDULE – CONTRACTOR PROVIDED ITEMS			
Section - Title	Duration from Order to Ship (In Weeks)	Item	Source of Supply
08710 Door Hardware	<2 to 3	Hardware components supplemental to Owner door packages or attached to Contractor provided door types.	As specified.
09900 Paint and Coatings	1.5	Exterior wall and metal coatings.	Direct from Coating Mfrs.

PRODUCT ORDER DURATION SCHEDULE – OWNER FURNISHED ITEMS			
Section - Title	Duration from Coordination to Ship (In	Item	Supply Responsibility
06065 Plastic Materials	2 weeks prior to Week 0	Plastic Bollard Sleeves	HJC
	4	Plastic Transition Strip at Walk-In Freezer	HJC
06400 Architectural Woodwork	2-3	Vision Center	QualServ, IDX
	3-4	Breakroom	QualServ, Royston
	2 weeks prior to Week 0	-Custom Architectural Wood Slat Panel -Custom Architectural Interior Entry Ledge	HJC
06424 Protective Surfacing	2 weeks prior to Week 0	-Wainscot Protective Surfacing Sheet -Adhesives	HJC
Not specified: Vestibule Rolling Security Door	8	Special Project: Owner furnished and installed	DH Pace
08110 Steel Doors and Frames	<3 7*	-Steel Doors, Panels, and Frames -Glazed Light Frames	DH Pace
	4 6*	Pharmacy Pocket doors	
08150 Recycled HDPE Doors		Interior recycled plastic man doors	DuraServ
08383 Traffic Doors	3	-Full-Height Traffic Doors -Café Style Traffic Doors	Direct from Mfrs.
08462 Automatic Sliding Doors	8		Direct from Mfrs.
08710 Door Hardware	3	Hollow Metal or Recycled HDPE Door hardware sets, thresholds, weatherstripping and seals	By door Supplier.
	<2	Positive Lock for HM or HDPE Door	Mfr is sole Supplier.
08710 Door Hardware	8	Operating or integral hardware components for Automatic Sliding doors and any other door types included in Sect.	By door Supplier.
09310 Ceramic Tile	2 weeks prior to Week 0	Restroom and all other locations.	HJC
09650 Resilient Flooring		Vinyl flooring tiles and base, Transition Strip, Adhesives	HJC
09655 Resilient Base		All	HJC
09656 Recycled Rubber Flooring		Recycled Rubber Flooring & Adhesive	HJC



PRODUCT ORDER DURATION SCHEDULE – OWNER FURNISHED ITEMS

Section - Title	Duration from Coordination to Ship (In	Item	Supply Responsibility
09680 Carpet		Pharmacy Carpet Tile, Adhesive, & Transition	HJC
09720 Architectural Faux Tile Panel		All	HJC
10160 Metal Toilet Compartments		Stainless Steel Toilet Compartments and Screens; Partition Occupancy Indicator	HJC
10810 Toilet Accessories		All	HJC
10260 Wall and Corner Guards	6	Case Protection	McCue Corp
	2 weeks prior to Week 0	Tire Stops, High Impact Corner guards, Pharmacy Radius End Guard	HJC
13030 Modular Building Components	6-8	Modular Pharmacy packages	As specified depending on type of modular program.
13121 Fabric Structures	4	Shade cloth and truss systems	Direct from Mfr.
13300 Net Barrier System	2	Over walk-in coolers.	HJC
13900 Fire Suppression	3	Sprinkler heads	HJC
15100 Piping and Equipment	2 weeks prior to Week 0	Pumps, liquid transfer pumps (sump and others)(not domestic pumps), water piping specialties and drainage piping specialties as scheduled on drawings	HJC
15300 Specialty Piping Systems	2 7**	Vacuum plumbing system (non-proto)	
15410 Plumbing Fixtures	2 weeks prior to Week 0	Fixtures, Lavatory decks	
15480 Water Heaters		All - Water heaters, recirc pumps, valves, and pumps	
Division 16 Electrical Switchboards and Distribution Equipment	25 - 60		As specified.
Shown on Drawings: xxxxxxxx			

\*Atypical or specially manufactured equipment; windstorm rated doors. (In Weeks).

\*\*Whole system (Pharmacy).

END OF SCHEDULES

END OF SECTION

SECTION 01700 - EXECUTION REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
  - 1. General Construction Requirements
  - 2. Verification of Existing Conditions
  - 3. Work Within and Adjacent to Existing Building Area.
  
- B. Related Requirements:
  - 1. Drawings - General Information Sheet N1.

1.2 GENERAL CONSTRUCTION REQUIREMENTS

- A. General Requirements, Site Verification Requirements, and Demolition Requirements:
  - 1. Provisions and requirements for execution are included in the Drawings.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used

END OF SECTION

## SECTION 01731 - CUTTING AND PATCHING

## PART 1 - GENERAL

## 1.1 SUMMARY

## A. Section Includes:

1. Requirements and limitations for cutting and patching Work.
2. Products for patching and extending Work.
3. Transitions and adjustments.
4. Repair of damaged surfaces, finishes, and cleaning.

## B. Related Requirements:

1. Construction Contract Between Walmart and Contractor (Par 3.12): Additional requirements for cutting and patching.
2. Section 01351 – Regulatory Compliance:
  - a. Disposal and removal of hazardous construction and universal waste.
  - b. Work practice control methods for airborne respirable dust.
3. Section 01500 - Temporary Facilities and Controls: Temporary barriers.
4. Section 02023 - Selective Site Demolition: Procedures for removing existing materials and equipment.

## 1.2 REFERENCES

## A. Occupational Safety and Health Administration (OSHA):

1. OSHA 01926.1153 Respirable Crystalline Silica

## 1.3 ENVIRONMENTAL REQUIREMENTS

- A. Minimize dust emissions or provide equipment that suppresses dust.

## 1.4 PERFORMANCE REQUIREMENTS

- A. Cutting and patching shall be performed as required for cutting into existing construction to provide for installation or performance of other work and subsequent fitting and patching required for restoration of surfaces to their original condition.
- B. Cut into or partially remove portions of the existing building as required for new construction. Include such work as:
  1. Cutting, moving or removal of items shown to be cut, moved or removed.
  2. Cutting, moving or removal of items not shown to be cut, moved, or removed, but which must be cut, moved, or removed to allow for new construction. Work or items which are to remain in the finished work shall be patched or reinstalled after cutting, moving, or removal, and joints and finishes shall match adjacent or similar work.
  3. Removal of existing surface finishes as needed to install new work and finishes.
  4. Removal of abandoned items and removal of items rendered no longer required resulting from alterations such as abandoned piping and electrical conduits to nearest J-boxes.
  5. Repair or removal of dangerous or unsanitary conditions resulting from alterations work.
- C. Structural Work:
  1. Do not cut and patch structural work in manner resulting in reduction of load-carrying capacity or load and deflection ratio.
- D. Operational Limitations:
  1. Do not cut and patch in manner resulting in decreased performance, shortened useful life, or increased maintenance.

- E. Quality Limitations: Do not cut and patch work exposed to view (exterior and interior) in manner resulting in noticeable reduction of aesthetic qualities and similar qualities, as determined by the Walmart Construction Manager.
- F. Limitation on Acceptance: Walmart Construction Manager's acceptance to proceed with cutting and patching shall not waive right to later require removal or replacement of work found to be cut and patched in unsatisfactory manner as determined by Walmart Construction Manager.
- G. Obtain all required inspections and approvals from authorities having jurisdiction for Temporary Certificate of Occupancy for Offices and Stockroom at least seven calendar days prior to Walmart scheduled move into new Office and Stockroom areas.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Use materials for cutting and patching that are identical to existing materials. If identical materials are not available or cannot be used, use materials that match existing adjacent surfaces to fullest extent possible with regard to visual effect. Use materials for cutting and patching that will result in equal or better performance characteristics.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine surfaces to be cut and patched and conditions under which work is to be performed before cutting. Take corrective action before proceeding with work if unsafe or otherwise unsatisfactory conditions are encountered.

### 3.2 PREPARATION

- A. Temporary Support: Provide temporary support of work to be cut to prevent failure.
- B. Protection:
  1. Protect other work during cutting and patching to prevent damage.
  2. Provide protection from adverse weather conditions for that part of project that may be exposed during cutting and patching operations.
  3. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
  4. Take precautions not to cut existing pipe, conduit, or duct serving building but scheduled to be relocated until provisions have been made to bypass them.

### 3.3 CUTTING AND PATCHING

- A. Remove, cut and patch work in a manner to minimize damage and to provide means of restoring products, materials, and finishes to match original condition.
- B. Cutting and removal work shall be performed so as not to cut or remove more than is necessary and that are least likely to damage work to be retained or adjoining work.
- C. Conduct work in such a manner as to minimize noise and to minimize accumulation and spread of dirt and dust.
- D. Use hand tools or small power tools designed for sawing or grinding. Avoid hammering and chopping.
- E. Where cutting cured concrete or masonry is required, use saws equipped with integrated water delivery systems that continuously feed water to the blade, or a HEPA-rated filter dust collection vacuum system recommended by the manufacturer to maintain dust emissions below the permissible level.

- F. Where core drilling or grinding concrete is required, use power tools equipped with HEPA-rated filter dust collection vacuum system recommended by the manufacturer to maintain dust emissions below the permissible level.
- G. To avoid marring existing finished surfaces, cut and drill from exposed or finished side into concealed surfaces. Temporarily cover openings when not in use.
- H. Cut holes and slots neatly to size required with minimum disturbance of adjacent work. Use HEPA-rated filter vacuums to clean holes and slots.
- I. Dispose of construction waste in accordance with the requirements of Section 01351.
- J. Patch with seams that are durable and as invisible as possible. Comply with specified tolerances for work.
- K. If the surrounding surface cannot be matched, repaint or recoat the entire surface to nearest corner or transition point.

### 3.4 TRANSITIONS

- A. Where new work abuts or aligns with existing work, provide a smooth and even transition. Patched work shall match existing adjacent work in texture and appearance.
- B. Where finished surfaces are cut in such a way that a smooth transition with new work is not possible, terminate the existing surface along a straight line at a natural line of division.
- C. Where two or more spaces are indicated to become one space, reconstruct ceilings to provide horizontal planes without breaks, steps or bulkheads.
- D. In cases of extreme change of ceiling or floor, obtain instructions from Walmart Construction Manager as to method of making an acceptable transition.

### 3.5 REPAIR OF DAMAGED SURFACES

- A. Patch or replace portions of existing surfaces which are damaged, discolored, or showing imperfections. Repair substrate prior to patching finish.
- B. Restore existing work that is damaged during construction to a condition equal to its condition at the time of the start of the Work.
- C. At locations in existing areas where partitions are removed, patch the floors, walls and ceilings with finish materials to match new finishes.
- D. Where plumbing is removed and capped below finish floor, core drill concrete floor as required using proper dust control methods as specified herein. Cap a minimum of 8" below floor. Patch hole with new concrete to match existing floor.

### 3.6 REMOVAL AND REPLACEMENT OF EXISTING WORK

- A. Remove existing items, services, finishes or surfaces as required for installation of new construction.
- B. Repair, re-route, and extend services, piping and conduit of existing items and equipment as required during construction operations for installation and operation of new items and equipment. When existing equipment to remain is removed or relocated, re-install as required for proper operation.

END OF SECTION

## SECTION 01740 – CLEANING

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Cleaning of building and site premises included in the scope of contractual construction work.
  - 2. Professional commercial post-construction cleaning of selected areas not affected by construction work for the purpose of aesthetic improvement.
- B. Related Requirements:
  - 1. Section 01351 – Regulatory Compliance: References to Contract Provisions for waste management and work practice control methods.
  - 2. Section 15410 – Plumbing Fixtures: Porcelain finish repair for water closet fixtures.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. Occupational Safety and Health Administration (OSHA):
  - 1. OSHA 01926.1153 Respirable Crystalline Silica.

## 1.3 QUALITY ASSURANCE

- A. Professional Commercial Cleaning Qualifications: Commercial cleaning for building improvement as specified in Part 3 herein shall be performed by a firm regularly engaged in commercial cleaning for a continuous period of not less than 2 years. Firm shall be experienced in work of the nature and scale similar to this project.

## 1.4 ENVIRONMENTAL REQUIREMENTS

- A. Dispose of construction and universal waste in accordance with requirements of Section 01351 and local, state, and Federal regulatory codes and regulations.
  - 1. Store volatile waste in covered metal containers and remove from premises daily. Prevent accumulation of wastes which create hazardous conditions.
  - 2. Do not burn or bury rubbish and waste materials on the project site.
  - 3. Adhere to volatile fluid waste disposal and wastewater regulations.
- B. Minimize dust emissions or provide equipment that suppresses dust.

## 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Transport, handle, store, and protect products in compliance with the requirements of Section 01600.
- B. Do not store flammable materials or liquids in any part of the existing or new building premises.

## PART 2 - PRODUCTS

## 2.1 CLEANING MATERIALS

- A. Verify that selected cleaning products are manufactured according to local, state, and Federal regulations and that manufacturers are regularly engaged in the production of such products.

- B. Verify that materials are clearly labeled.
- C. Use solutions and products specifically formulated and recommended for cleaning the surfaces without damage to either the primary or adjacent surfaces.
  - 1. Use only cleaning materials recommended by the manufacturer of the surface to be cleaned.
  - 2. Use cleaning products only on surfaces recommended by cleaning product material manufacturer.
- D. Use products that are not toxic or caustic to metal or acoustic surfaces.

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Coordination and Scheduling:
  - 1. Perform cleaning during periods when store is closed or during low traffic periods, typically between 10:00 pm and 6:00 am.
  - 2. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet, newly-painted surfaces.
  - 3. Coordinate cleaning schedule with store manager. Coordinate with and submit to Store Manager cleaning schedule at least 7 days prior to commencement of cleaning operations.
- B. Periodically inspect equipment to ensure equipment is operating optimally and safely.
  - 1. Verify equipment is adequately diapered, hose connections are tight, and fasteners are secure. Repair leaks and provide maintenance where required.
- C. Each day, clear work and access areas. Maintain premises free from accumulations of waste, debris, and rubbish caused by construction operations.
- D. Segregate and sort waste materials by type and class as directed by local, state, and Federal regulations.
- E. Do not leave cleaning materials unattended while in use.
- F. Clean each project phase when completed.
- G. Interior – General:
  - 1. Vacuum clean interior building areas on an as-needed basis and prior to areas receiving finish painting.
  - 2. Use vacuum with HEPA-rated filter to clean concrete, masonry, gypsum board, stone and tile surfaces.
- H. Exterior – General:
  - 1. Clean exterior premises daily. Keep streets and access to site free of rubbish and debris.
  - 2. Do not allow exterior debris to enter customer areas.
  - 3. Sprinkle dusty debris with fine water mist to control accumulation of dust. Avoid puddling.

### 3.2 FINAL CLEANING OF CONSTRUCTION AREAS

- A. Execute final cleaning prior to final inspection in areas which are included in the scope of construction and disrupted in the course of completion of the work as follows.
  - 1. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances.
  - 2. On exterior hard surfaces, do not use products or methods which may disturb natural weathering.
  - 3. Clear construction waste from grounds and landscaped areas.

4. Clean construction waste from paved areas. If waste is silt or sand, use equipment fitted with a HEPA-rated filter.
  5. Remove tools, construction equipment, and machinery.
  6. Remove construction waste from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, and attics.
  7. Clean debris from roofs, gutters, downspouts, and drainage systems.
  8. Vacuum construction dust and debris with HEPA-rated filter equipment. Remove debris and excess nap from carpets; shampoo if visible soil or stains remain.
  9. Thoroughly clean any new flooring.
  10. Remove glazing compounds and other vision-obscuring materials from mirrors and reflective surfaces. Replace chipped or broken glass.
  11. Remove labels that are not permanent.
  12. Touch up exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored.
  13. Remove excess lubrication, paint, and mortar droppings, and other foreign substances from mechanical and electrical equipment.
  14. Clean stains from plumbing fixtures if exposed to water during construction.
  15. Repair or replace damaged light fixture lenses and fluorescent lamps and ballasts.
    - a. Replacement fluorescent lamps and ballasts shall be furnished by Owner. All other light fixture parts shall be contractor provided.
- B. Leave premises ready for occupancy.

### 3.3 COMMERCIAL CLEANING FOR BUILDING IMPROVEMENT

- A. In addition to final cleaning of contractual construction areas, perform professional commercial construction cleaning . Professional commercial construction cleaning does not relieve the Contractor of responsibility for general and final cleaning within the scope of this Section.
- B. Except where noted otherwise in the following individual scope descriptions, commercial cleaning shall be performed after completion of the construction work scheduled in each area.
- C. Use high-filtration vacuums and other methods to ensure capture of respirable dust and environmental contaminants.
- D. Collect, contain, and haul from premises any waste generated by commercial cleaning.
- E. Suspended Acoustic Panel Ceiling and Overhead Structure:
  1. Acoustical panel ceiling elements to remain in place in Vestibule (if applicable), Restrooms, and Non-Customer areas including Bakery and Deli, Management and Security Offices, Training Rooms, and Breakroom: Thoroughly clean trim, edge moldings, suspension system members, light diffusers, speakers, and camera mounts. Clean as follows:
    - a. Cover entirely with drop cloths, all merchandise, furniture, equipment, and floors in areas to be cleaned.
    - b. Dust or vacuum panels and suspension system to remove loose dirt and dust.
    - c. Apply cleaning solutions by spray or mist at a rate recommended by product instructions depending on type and porosity of surface to be cleaned.
    - d. Allow sufficient time as recommended by product instructions for solutions to react.
    - e. Remove solutions with sponges and wipe dry.
    - f. Follow written instructions of product manufacturer where such instructions vary from, or are in addition to, the foregoing procedures.
  2. Exposed overhead structure at Vestibule: Thoroughly clean structural steel, steel joists, metal deck, and bracing members; and suspended items including drop boxes, ductwork, polycarbonate structures, fans, light diffusers, and light fixtures:
    - a. Cover entirely with drop cloths, all merchandise, furniture, equipment, and floors in areas to be cleaned.



- b. Dust or vacuum to remove loose dirt and dust.
  - 3. Cleaning Products: Use products meeting the requirements of Part 2 herein and the following:
    - a. Enzyme based or of such ingredients to effectively clean, whiten, and dissolve nicotine tar, cooking oils and grease, soiling, soot, smoke, mildew, and dirt films.
    - b. Do not use products containing bleach.
  
- F. Public (Customer) Restrooms and Non-Public (Associate) Restrooms, including restrooms at Auto Center, Pharmacy, Vision Center, and Academy: Thoroughly clean walls, floors, ceilings, plumbing fixtures, toilet partitions, and accessories.
  - 1. Ceiling: Clean suspended acoustic ceiling elements to remain as specified herein above.
  - 2. Existing ceramic floor tile:
    - a. Vacuum as specified herein to remove loose debris.
    - b. Apply cleaning product to entire floor and allow to sit on slab 10 minutes to allow product to penetrate grout joints and tile surface soil film. Rewet as necessary during dwell time to keep floor wet with cleaner.
    - c. Scrub with medium bristle brush on slow speed electric buffing machine, making (2) passes minimum in alternating directions to ensure thorough cleaning. Use edging tool or deck brush in corners and around floor-mounted fixtures.
    - d. Capture and remove rinse solution or dispose to floor drain.
  - 3. Wall surfaces:
    - a. Steam clean tiled wall surfaces. Wet vacuum residual water and wipe dry to prevent surface film or residue.
    - b. Do not steam clean painted gypsum board surfaces. Clean painted surfaces using products and methods as recommended by the paint manufacturer.
  - 4. Water Closet Fixtures: At time of fixture removal in preparation for new floor and wall finishes, examine existing to remain toilets and urinals to determine level of cleaning necessary.
    - a. After removal and before storing, thoroughly clean inside fixture bowls and exterior porcelain finishes. Remove all stains from mineral deposits and lime scale, hard water, and rust from inside bowls. Use cleaners approved by fixture manufacturers.
    - b. If visual inspection identifies chips or shallow nicks in the porcelain finish in and around the bowl and other horizontal surfaces, provide porcelain finish repair prior to reinstallation as specified in Section 15410.
    - c. If visual inspection identifies structural or surface cracks in the porcelain surfaces, or other structural damage to the fixture, do not clean, repair, or reinstall the existing fixture.
  - 5. Clean and polish stainless steel accessories and toilet partitions to a spotless luster using soap, ammonia, or mild detergent and water as recommended by the accessory or partition manufacturer. Alternatively, use a commercial stainless steel cleaner and polish as directed.
  - 6. Clean mirror surfaces using glass cleaner.
  - 7. Cleaning Products and Equipment: Use of Owner's products and equipment is not allowed. Provide products meeting the requirements of Part 2 herein and the following:
    - a. Slow speed (175 RPM) electric buffing machine (restrooms with more than one toilet fixture where space allows).
    - b. Medium bristle brush for buffing machine.
    - c. Scrub brush for corners and along walls.
    - d. Mop buckets.
    - e. Clean general purpose cotton mop.
    - f. Heavy duty wet/dry vacuum.
    - g. Edging tool or deck brush.
    - h. Floor squeegee.
  
- G. Vestibule, Customer Sales Areas: Perform cleaning including the following.
  - 1. Ceiling: Clean suspended acoustic ceiling elements to remain (if applicable) and overhead structure as specified herein above.
  - 2. Fans: In coordination with overhead structure cleaning, clean ceiling mounted and fixture fans in Vestibule and Customer areas.

- a. Clean any existing fans within Garden Center.
  - 3. Dust and wipe shelves, ledges, sills, slopes, walls, base, mill work, signage, and fixtures.
  - 4. Polish interior and exterior storefront glazing.
  - 5. Clean door hardware and electrical or cover plates.
  - 6. Thoroughly clean existing floor:
    - a. Steam clean textured concrete or porcelain tile flooring.
    - b. Vacuum and shampoo existing carpets to a stain-free condition.
  - 7. Clean tile or slab joints and corners.
  - 8. Notify Owner's Store Manager of items requiring attention including paint touch-ups or permanent spill stains. Notify Owner's Construction Manager or other authorized Owner's representative of items requiring replacement or repair including but not limited to floor mats, lighting fixtures, cover plates, and grout or joint filler.
- H. Food Preparation Areas: Provide the services of a Commercial Restaurant Cleaning Company specializing in deep cleaning of commercial food prep and food service areas.
- 1. Commercial Restaurant Cleaning Company shall demonstrate a minimum five years' experience in cleaning similar food service areas. Perform the following:
    - a. Clean building elements to remain in place, including walls, floors, ceilings, food service fixtures, and plumbing fixtures, as well as non-fixture equipment and appurtenances.
    - b. Ceiling: Clean suspended acoustic ceiling elements to remain as specified herein above.
    - c. Restrooms: Walls, floors, water closets, and other fixtures as specified for Restroom cleaning herein.
  - 2. Cleaning Products and Equipment: Use of Owner's products and equipment is not allowed. Provide general and restroom cleaning products and equipment specified herein and meeting the requirements of Part 2.
- I. Auto Care Center: Provide commercial grease cleaning of automotive care areas. Perform degreasing work after any scheduled removal and prior to installation of new equipment, fixtures, and finishes.
- 1. Use an [ECOLAB, Inc.](#) degreasing product or another industrial heavy-duty degreasing product intended for the specific surface and meeting the OSHA minimum air quality requirements for use in occupied areas.
  - 2. Verify grease cleaning products do not mar or discolor stainless steel and wall surfaces.
  - 3. Thoroughly degrease vertical and horizontal surfaces, existing to remain equipment and fixtures, restrooms, doors, and hardware.

### 3.4 FIELD QUALITY CONTROL

- A. Prior to Owner possession, conduct an inspection of entire premises with Construction Manager to verify conformance with the requirements herein.

END OF SECTION

## SECTION 01770 (01 7700) - CONTRACT CLOSEOUT

## PART 1 - GENERAL

## 1.1 SUMMARY

## A. Section Includes

1. Closeout Procedures.
2. Final Closeout Submittals.
3. Closeout Document Submission.
4. Record Letters of Conformance.
5. Letters of Certification.
6. Project Record Documents.
7. Operations and Maintenance Data.
8. Warranties and Bonds.

## B. Related Requirements:

1. Section 01740 – Cleaning: Requirements for final cleaning.

## 1.2 CLOSEOUT PROCEDURES

A. Comply with closeout submittal requirements defined within individual Sections. Submittal procedures described herein shall apply unless otherwise described in individual Sections.

B. When Contractor considers Work to be Substantially Complete, submit written certification to Owner's Construction Manager as follows.

1. Contract Documents have been reviewed.
2. Work has been inspected.
3. Work is complete in accordance with Contract Documents.
4. Work is ready for inspection.

## 1.3 FINAL CLOSEOUT SUBMITTALS

A. Definition: Closeout submittals are submittals specified in the individual sections as "Closeout" and shall not be otherwise considered a closeout document regardless of the type of submittal. Submittals not classified as a closeout submittal shall be considered a regular submittal under the provisions of Section 01330. For example: Maintenance Data may, or may not, be classified as a closeout unless specifically identified as a closeout in the individual section Part 1 SUBMITTAL paragraph.

B. Unless otherwise specified in the individual sections, submit closeout submittals to the Owner within 90 days after Substantial Completion of the Work.

C. All closeout documents specified in the individual sections shall be submitted. Specific documents listed below shall be included separately in an Electronic Closeout Document Submission as specified hereinafter.

D. Final closeout submittals shall be received and approved by Owner before final application for payment will be approved.

## 1.4 CLOSEOUT DOCUMENTS FOR OWNER FURNISHED EQUIPMENT

A. Closeout documents for Owner furnished equipment as required and specified in the Appendix A shall be obtained directly from the Owner's vendor, supplier, or manufacturer. When, or if, documents are unavailable directly from the vendor, Contact Realty Procurement Services for assistance in obtaining the required documents.

## 1.5 ELECTRONIC CLOSEOUT DOCUMENT SUBMISSION

- A. Submit Electronic Closeout Documents electronically through Owner's approved online system. Documents included in Electronic Closeout Document Submission shall consist only of the items in the following numbered list. Note that all closeout documents are not necessarily included in the Electronic Closeout Document Submission. If any item listed below is not applicable, include a "Not Applicable" sheet within the uploaded section of the Electronic Closeout Document Submission. The Electronic Closeout Document Submission shall not be compiled based only on the brief description of each item in the following list. It is compulsory that the individual sections and references be examined to comprehend the full description of the specific item to be included. Include the following:
1. Contractor's Statement of Warranty (Reference Article 3.4 of the Construction Contract.) (Reference form included at end of this Section.)
  2. Certificate of Occupancy: Submit as Electronic Closeout Document by uploading an electronic file of the C of O to the [Walmart Quickbase Certificate of Occupancy Tracking Application](#).
  3. Subcontractor Assignment: Submit a final list of Subcontractors used (Reference Article 3.5 of the Construction Contract). Include the following information for each Subcontractor:
    - a. Daytime and after-hours telephone numbers.
    - b. Address.
    - c. Quarterly expenditure detail.
  4. Signed and notarized lien waivers from Contractor and all Subcontractors. (Reference Article 5.3. and associated Exhibits of the Construction Contract.) The waivers shall have no modifications or changes made thereon.
  5. Copies of Performance and Payment Bond. (Reference Article 7.5 of the Construction Contract.)
  6. Consent of Surety to Final Payment from Bonding Company. (Reference Article 5.3 of the Construction Contract.)
  7. Substantial Completion Punchlist: Building, Civil, and BAS/HVAC/Refrigeration punch lists showing items completed and approved by Owner. (Reference Article 5.2 of the Construction Contract.)
  8. Asset Tag Data Collection Application: HVAC/Refrigeration equipment tag QR codes and data input into the application and confirmed by Walmart in accordance with Sections 15050, 15600 and 15700, as well as the deletion from the application of any demolished or removed equipment.
  9. Registration of Storage Tanks with State (Sections 11140 and 13220).
  10. Verification of transmittal to Store Manager of all Project Record Documents specified hereinafter and Operations and Maintenance Manuals. This shall be in the form of a Letter of Transmittal with a statement signed by the Store Manager verifying that the O & M manuals have been placed in the Electrical Distribution Center (EDC) by the Contractor and the placement witnessed by the Store Manager.
  11. Warranties: Include warranties for the following as applicable when the specified Section is included in the project.
    - a. Membrane Roofing. Submit Roofing Warranty included at the end of Roofing Section (Sections 07530 ). Manufacturer's standard warranty will not be considered as a substitute for the warranty included therein.
    - b.
  12. Record Letters of Conformance: Include separate letter for each item listed below. Include letters for the following as applicable when the specified specification section is included in the project.
    - a. Contractor Quality Control (Section 01452)
    - b. Construction Testing Laboratory (Owner's CTL – Appendix B).
  13. Inspection Reports: Include separate report for each required item listed below. Include reports for the following as applicable when the specified Section is included in the project.
    - a. Building Services Piping (Section 15100).
      - 1) Video Inspection Report.
      - 2) Dye Testing Report (If specified).
    - b. Electrical Service Entrance Testing and Inspection Report (Sections 16402 and 16405).
  14. Copy of Signed Notice of Termination of NPDES Construction General Permit with proof of submittal to appropriate agency. This is only applicable for those permits issued to the General Contractor. (Section 02370 erosion)
- B. If Contractor fails to provide a fully completed Electronic Closeout Document Submission within 90 days after Substantial Completion of the Work, then Contractor agrees to pay Owner the sum of \$250.00 per day, as liquidated damages and not as a penalty, until the fully completed Electronic Closeout Document Submission is received and approved by Owner Contract Administration.

## 1.6 RECORD LETTERS OF CONFORMANCE

- A. Submit Record Letters of Conformance as a Closeout Submittal. By submitting Record Letter of Conformance, the Contractor declares that the product identified by manufacturer's name and model number is the product specified and is suitable for the intended use as defined within the Contract Documents and has been provided and placed in operational condition in accordance with the manufacturer's published instructions and the Contract Documents.
  - 1. Submit completed Record Letter of Conformance for each product selected as indicated within each Section.
  - 2. Complete required information on form and sign in ink by person authorized to sign on behalf of the Contractor.
  - 3. No modifications shall be made to the form.
  - 4. Record Letters of Conformance, when required, are located at the end of the respective Section.

## 1.7 LETTERS OF CERTIFICATION

- A. Certify manufacturer's or installer's qualifications, conformance with tests or specified criteria, or other factors as required in individual specification sections.
- B. Submit supporting reference data, affidavits, and certifications as required.

## 1.8 PROJECT RECORD DOCUMENTS:

- A. Maintain on site, one set of the following record documents. Record actual revisions to the Work.
  - 1. Contract Drawings. (Building and Civil)
  - 2. Specifications.
  - 3. Addenda.
  - 4. Change Orders and other Modifications to the Contract.
  - 5. Reviewed shop drawings, product data, and samples.
- B. Maintain Record Documents separate from documents used for construction.
- C. As-built Record Documents and Shop Drawings: Record as-builts shall be maintained and submitted for the primary purpose of recording the locations for concealed interior and exterior underground utilities as specified in the individual specifications. Legibly record actual measured horizontal and vertical locations of interior and exterior underground utilities and appurtenances, referenced to permanent surface improvements.
- D. Record required as-built information concurrent with construction progress. Do not permanently conceal work until required information has been recorded.
- E. At Project completion, the Contractor shall place the Record Documents (including Building and Civil Record Drawings, Specifications, Addenda, and Change Orders) enclosed in a plastic pipe tube (fixed cap at one end and a threaded-cap on the other end) for storage in the Electrical Room unless otherwise specified to be located in another location in the individual sections. Placement shall be in the presence of and witnessed by the Store Manager.

## 1.9 OPERATION AND MAINTENANCE DATA

- A. Operation and Maintenance data shall include a suitably bound set of descriptive literature, maintenance and operation data, and parts lists for each item of equipment provided under this Contract that will require maintenance or special operating procedures, including drawings, instructions, or manuals supplied with equipment furnished by others and installed under this Contract. Submittal of O&M data shall be in the form of the bound set of O&M data and placement by the Contractor in the Electrical Distribution Center (EDC) room within the building unless otherwise specified to be located in another location in the individual sections. Do not include O&M data in the Electronic Closeout Document Submission or submit to Owner's Contract Administration. Placement of documents shall be witnessed by the Store Manager and shall be at least 14 days prior to final inspection.

## 1.10 WARRANTIES AND BONDS

- A. Submit required warranties and bonds through the Electronic process.
  - 1. Assemble documents from Subcontractors, suppliers, and manufacturers.

2. For equipment put into use with Owner's acceptance during construction, submit within ten days after first operation, listing date of acceptance as start of warranty period.
3. For items of Work delayed materially beyond Date of Substantial Completion, provide updated submittal within ten days after acceptance, listing date of acceptance as start of warranty period.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

**AFFIDAVIT OF TOTAL RELEASE AND CERTIFICATION OF ALL BILLS PAID**

Replaced by Construction Contract Par 5.3 and Exhibits.

**CONTRACTOR'S LETTERHEAD**

**CONTRACTOR'S STATEMENT OF WARRANTY**

DATE:

PROJECT:

LOCATION:

OWNER: Walmart Stores, Inc.  
2001 SE 10<sup>th</sup> Street  
Bentonville, AR 72716-5520

CONTRACT: Construction Contract Between Walmart and Contractor, dated \_\_\_\_\_ 20\_\_\_\_.

Contractor hereby: (1) warrants that the Work for Project complies with Article 3.4 of the Construction Contract ; (2) acknowledges that its warranty obligations under such Article 3.4 extends one year beyond the actual date of Substantial Completion of the Project; and (3) affirms the enforceability of other warranties made by Contractor in the Contract.

Terms used but not defined herein shall have the meanings given to them in the above referenced Contract.

The undersigned Contractor hereby makes the certifications set forth herein to Owner as of the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

Witness:

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

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

Print Name: \_\_\_\_\_ Name: \_\_\_\_\_

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

STATE OF \_\_\_\_\_  
COUNTY OF \_\_\_\_\_

On this the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_  
before me, a Notary Public, within and for the State and County aforesaid, personally appeared, to me well know (or proved to me on the basis of satisfactory evidence), who stated upon oath that (s)he had executed the foregoing instrument for the consideration set forth therein.

\_\_\_\_\_  
Notary Public  
My commission expires: \_\_\_\_\_



## SECTION 02251 - SHORING

## PART 1 - GENERAL

## 1.1 SUMMARY

## A. Section Includes:

1. Shoring at excavations and building structural and non-structural elements required to provide temporary support during excavating, demolition, and construction operations.
2. Temporary protection including without limits for construction workers, materials, existing construction other adjacent properties, and public.

## B. Related Sections:

1. Section 01700 - Execution Requirements: Requirements and limitations for cutting and patching Work.
2. Section 01731 - Cutting and Patching.
3. Section 02023 - Selective Site Demolition: Procedures for demolition and removal of existing building elements.

## 1.2 DESIGN REQUIREMENTS

- A. Design and provide shoring to safely prevent collapse of materials and structures and to permit construction operations to proceed in conformance with construction sequence phases indicated on Drawings.

## 1.3 QUALITY ASSURANCE

- A. Provide design of shoring by professional civil or structural engineer licensed in State in which project is located. Send design to Wal-Mart Construction Manager for documentation of this service.
- B. Coordinate shoring design and construction with:
  1. Soil Investigation Report prepared for this project (if applicable).
  2. Building structural system, including without limits to locations of footings, columns, pilasters, walls, and other related structural elements.
- C. Comply with pertinent requirements of Authorities Having Jurisdiction (AHJ).
- D. The Contractor shall be responsible for means and methods of shoring and temporary support and for the sequences and procedures to be used.

## PART 2 - PRODUCTS

## 2.1 MATERIALS

- A. Provide materials as required for shoring system design.

## PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Examine surfaces and adjacent areas where Work under this Section will be performed. Do not proceed with Work until unsatisfactory conditions have been corrected.
- B. Starting Work constitutes acceptance of existing conditions. Be responsible for correcting unsatisfactory and defective Work encountered after starting Work.

## 3.2 INSTALLATION

02251-1

- A. Install shoring system in accordance with shoring design drawings.
- B. Coordinate placement of shoring system elements with existing Work and approved demolition procedures as specified in Section 02023.
- C. Perform cutting and patching required by installation of shoring in accordance with approved Cutting and Patching Procedures and Sequencing Plan as specified in Section 01731.

3.3 FIELD QUALITY CONTROL

- A. Shoring Design Engineer: Inspect and approve shoring materials and installation prior to start of any demolition work.
- B. Submit inspection report to Wal-Mart Construction Manager.

END OF SECTION

SECTION 02320 - EXCAVATING, BACKFILLING, AND COMPACTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
  - 1. Trenching and backfilling for utilities.
- B. Related Sections
  - 1. Division 3 – Subbase requirements for granular subbase below building slabs.
  - 2. Section 03531 – Architectural Concrete Overlay: Hydraulic cement overlay and polished concrete floor finish by Owner’s Preferred Flooring Contractor on trenched slab in customer view.
  - 3. Section 03366 – PVC/VCT Removal and Polished Concrete Floor Finishes for Interior Slabs: Polished concrete floor finish for exposed slab when resilient floor tile removal is primary scope for Owner’s Preferred Flooring Contractor.
    - a. Quality Assurance, Preferred Flooring Contractors, equipment, preparation, and polish process for architectural concrete overlay.

1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.

1.3 COORDINATION AND SCHEDULING

- A. Trenching of Exposed Slab in Customer Areas:
  - 1. Coordinate with Owner’s Preferred Flooring Contractor for customer area trench locations and PFC’s floor finish schedule.
  - 2. Coordinate timely procurement of trench fill fast-setting concrete products described in Part 2 herein.

1.4 QUALITY ASSURANCE

- A. Satisfactory Materials: ASTM D 2487 soil classification groups GW, GP, GM, SW, SP, SM, ML, CL, CH, MH, SC, GC, or a combination of these group symbols.
  - 1. Fill material shall further conform to the plasticity index and liquid limits (PI and LL) specified in Paragraph FILLING hereinafter.
  - 2. Satisfactory materials shall be free of rock or gravel larger than allowed for fill or backfill material as specified hereinafter or as shown on the drawings.
  - 3. Satisfactory materials shall contain no debris, waste, frozen materials, vegetation, and other deleterious matter.
  - 4. Unless specifically stated otherwise in "Foundation Subsurface Preparation" on the Drawings, the following table stipulates maximum allowable values for plasticity index (PI) and liquid limit (LL) of satisfactory materials to be used as fill in specified areas:

<u>Location</u>	<u>PI</u>	<u>LL</u>
Building area (below upper four feet)	20	50
Building area (upper four feet)	12	40

(References to depth are to finished floor elevation)

- B. Unsatisfactory Materials: Materials which do not comply with the requirements for satisfactory materials are unsatisfactory.

1. Unsatisfactory materials also include man-made fills; trash; refuse; backfills from previous construction; and material classified as satisfactory materials which contains root and other organic matter or frozen material. The CTL shall be notified of any contaminated materials.
2. Unsatisfactory materials also include satisfactory materials not maintained within 2 percent of optimum moisture content at time of compaction.

## 1.5 SUBMITTALS

- A. Trenching of Exposed Slab in Non-Customer Areas:
  1. Submit 30-pound sample of each type of off-site fill material that is to be used at the site in airtight containers to the construction testing laboratory or submit gradation and certification of aggregate material that is to be used at the site to the construction testing laboratory for review.
  2. Submit certification that all material obtained from off-site sources complies with specification requirements.
  3. Submit name of each material supplier and specific type and source of each material. Change in source throughout project requires approval of Owner.
  4. Submit Dewatering Plans upon request by Owner.
- B. Shop drawings or details pertaining to excavating and filling are not required unless otherwise shown on the Drawings or if procedures contrary to Construction Documents are proposed.
- C. Shop drawings or details pertaining to site utilities are not required unless required by regulatory authorities or unless uses of materials, methods, equipment, or procedures that are contrary to The Drawings or Specifications are proposed. Do not perform work until Owner has accepted required shop drawings.

## PART 2 - PRODUCTS

### 2.1 SLAB REPAIRS IN CUSTOMER AREAS: PRODUCTS

- A. Slab Trench Fill in Customer Areas: Provide the following fast-setting concrete repair material for trenches on floors in customer access and customer visible areas:
  1. Fast-Setting Fill Material: Non-metallic, high strength, cementitious structural repair material. Provide [Rapid Set Concrete Mix](#) by [CTS Cement Manufacturing Corp.](#), Garden Grove, CA, (800) 929-3030, [info@ctscement.com](mailto:info@ctscement.com).

#### Finished Floor Preparation in Customer Visible Areas:

1. Concrete Overlay Primer Material: Low odor, two-component, alkali resistant epoxy primer. pH resistant, 0 VOC. Provide [Rapid Set TXP Fast Epoxy Primer](#) by [CTS](#).
    - a. Primer Broadcast: Clean, #20 or #30 mesh silica sand.
  2. Concrete overlayment products for the finished floor are specified in Section 03531 and are the responsibility of Owner's Preferred Flooring Contractor.]
- C. Provide fast-setting and primer products by the manufacturer listed herein. No substitutions allowed.

### 2.2 MATERIALS

- A. Soil and Rock Materials:
  1. Fill and Backfill. Satisfactory materials excavated from the site.
  2. Imported Fill Material: Satisfactory material provided from offsite borrow areas when sufficient satisfactory materials are not available from required excavations.
  3. Trench Backfill: ASTM D 2321 unless otherwise specified or shown on the drawings.
  4. Building Subbase Material: Subbase for building and appurtenances slabs on ground is specified in Section 03314 as applicable.
  5. Bedding: Aggregate Type as indicated on the plans or naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No.200 sieve.

6. Drainage Fill: Washed, narrowly graded mixture of crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2- inch sieve and 0 to 5 percent passing a No.8 sieve.
  7. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D 448; coarse-aggregate grading Size 67; with 100 percent passing a 1-inch sieve and 0 to 5 percent passing a No.4 sieve.
- B. Equipment:
1. Transport off-site materials to project using well-maintained and operating vehicles. Once on site, transporting vehicles shall stay on designated haul roads and shall at no time endanger improvements by rutting, overloading, or pumping.
- C. Source Quality Control:
1. The Owner will perform testing of materials proposed for use in the project as specified in Appendix B (Section 02320).
  2. The Contractor shall provide samples of material obtained off-site.

### PART 3 - EXECUTION

#### 3.1 GENERAL PREPARATION

- A. Identify required lines, levels, contours, datum, elevations, and grades necessary for construction as shown on the drawings.
- B. Locate and identify existing utilities that are to remain and protect from damage.
- C. Maintain in operating condition existing utilities, previously installed utilities, and drainage systems encountered in utility installation. Repair surface or subsurface improvements shown on The Drawings.
- D. Verify location, size, elevation, and other pertinent data required making connections to existing utilities and drainage systems as indicated on The Drawings.

#### 3.2 GENERAL EXCAVATION

- A. Classification of Excavation: Verify type, quantity, quality, and character of excavation work to be performed. Excavation shall be considered unclassified excavation, except as indicated in the Contract Documents.
- B. Shore, brace, and drain excavations as necessary to maintain excavation as safe, secure, and free of water at all times.
- C. Place satisfactory excavated material into project fill areas.
- D. Unsatisfactory excavated material shall be disposed of in manner and location that is acceptable to Owner and local governing agencies.
- E. Perform excavation using well-maintained equipment designed and certified for indoor use and methods acceptable to Owner and local governing agencies. Monitor equipment emissions.

#### 3.3 TRENCHING EXCAVATION FOR UTILITIES

- A. Sawcut existing concrete slab and trench at proper width and depth for laying pipe, conduit, or cable. Cut trench banks vertical, if possible, and remove stones from bottom of trench as necessary to avoid point-bearing. Over-excavate wet or unstable soil, if encountered, from trench bottom as necessary to provide suitable base for continuous and uniform bedding. Replace over-excavation with satisfactory material and dispose of unsatisfactory material.
- B. Trench excavation sidewalls shall be sloped, shored, sheeted, braced, or otherwise supported by means of sufficient strength to protect workmen in accordance with applicable rules and regulations established for construction by the

Department of Labor, Occupational Safety and Health Administration (OSHA), and by local ordinances. Lateral travel distance to exit ladder or steps shall not be greater than 25 feet in trenches 4 feet or deeper.

- C. Perform trench excavation as indicated on the Drawings for specified depths. During excavation, stockpile materials suitable for backfilling in orderly manner far enough from bank of trench to avoid overloading, slides, or cave-ins.
- D. Remove excavated materials not required or not satisfactory as backfill or embankments and waste off-site or at on-site locations approved by the Owner and in accordance with governing regulations.
- E. Accurately grade trench bottom to provide uniform bearing and support for each section of pipe on bedding material at every point along entire length except where necessary to excavate for bell holes, proper sealing of pipe joints, or other required connections. Dig bell holes and depressions for joints after trench bottom has been graded. Dig no deeper, longer, or wider than needed to make joint connection properly.
- F. Trench width below top of pipe shall not be less than 12 inches nor more than 18 inches wider than outside surface of pipe or conduit that is to be installed to designated elevations and grades. Other trench width for pipe, conduit, or cable shall be least practical width that will allow for proper compaction of trench backfill.
- G. Trench depth requirements measured from finished slab shall meet the following requirements or applicable codes and ordinances, whichever is more stringent:
  - 1. Sanitary Sewer: Elevations and grades as indicated on the drawings and as specified in Section 02535.

3.4 PIPE BEDDING

- A. Excavate trenches for pipe or conduit to 4 inches below bottom of pipe and to the width as specified herein. Place 4 inches of bedding material, compact in bottom of trench, and shape to conform to lower portion of pipe barrel.

3.5 TRENCH BACKFILLING - GENERAL

- A. Materials used for trench backfill shall comply with requirements as specified herein.
- B. Backfill and compact in accordance with fill and compaction requirements in accordance with ASTM D 2321 unless otherwise shown on the drawings.
- C. Do not backfill trenches until required tests are performed and utility systems comply with and are accepted by applicable governing authorities.
- D. Backfill trenches as shown on the Drawings.
- E. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces.

3.6 COMPACTION

- A. Compact as follows:

<u>Location</u>	Percent of Maximum Laboratory Density	
	<u>ASTM D698</u>	<u>ASTM D1557</u>
Utility Trench Backfill	98	95

- B. Maintain moisture content of not less than 1 percent below and not more than 3 percent above optimum moisture content of fill materials to attain required compaction density.
- C. Exercise proper caution when compacting immediately over top of pipes or conduits. Water jetting or flooding is not permitted as method of compaction.

- D. Corrective Measures for Non-Complying Compaction: Remove and recompact deficient areas until proper compaction is obtained. Areas continually failing shall be stabilized at no additional cost to Owner. Notify the Architect of Record and the Wal-Mart Construction Manager should soil stabilization be required.

### 3.7 TRENCH AND FILL IN CUSTOMER AREAS

- A. Preparation: Saw-cut existing exposed slab as shown on Drawings.
- B. Trench to dimensions shown on Drawings and verify condition of subgrade as specified herein.
- C. Set joint reinforcements and forms as shown on Drawings.
- D. Mix fast-setting cement in accordance with manufacturer's written instructions.

For repaired slab exposed to customer view, place fast-setting cement to ½ inch below finished floor.]

- F. Hand trowel surface.
- G. Allow cement mix to self-cure. If necessary, use an evaporative slowing additive such as [Set Control Set Retarding Admixture by CTS Rapid Set](#).

Finished Floor in Customer Visible Areas: Begin preparations for applying epoxy primer after allowing cement mix to set for approximately 3 hours and mix has reached 3600 psi.

- I. Apply epoxy primer as specified in Section 03531. Do not allow primer to bleed or spread onto trench side walls, as staining will result in finished floor.
- J. Leave filled trench prepared and suitable for Owner's Preferred Flooring Contractor to begin floor finish work.]
- K. Provide protection over trench area as specified in Part 3 below.

### 3.8 MAINTENANCE OF SUBGRADE

- A. Verify finished subgrades to ensure proper elevation and conditions for construction above subgrade.
- B. Remove areas of finished subgrade found to have insufficient compaction density to depth necessary and replace in manner that will comply with compaction requirements by use of material with CBR or LBR equal to or better than that specified on the drawings. Surface of subgrade after compaction shall be firm, uniform, smooth, stable, and true to grade and cross-section.

### 3.9 BORROW AND SPOIL SITES

- A. Comply with NPDES and local erosion control permitting requirements for any and all on-site and off-site, disturbed spoil and borrow areas. Upon completion of spoil or borrow operations, clean up spoil or borrow areas in a neat and reasonable manner to the satisfaction of Owner or off-site property owner, if applicable.

### 3.10 SLAB PROTECTION IN CUSTOMER AREAS

- A. Provide stable protection board over backfilled trenches on slab in customer access and customer view areas.

If installation of concrete overlayment by Owner's Preferred Flooring Contractor is not performed immediately, continue maintaining protection board until PFC's work begins.]

### 3.11 FIELD QUALITY CONTROL

- A. Field quality control shall be the responsibility of the Contractor in accordance with Section 01452. Except as specified as mandatory, field quality control testing and inspection shall be at the discretion of the Contractor as  
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necessary to assure compliance with Contract requirements. Owner T&I specified in Appendix B shall not preclude Contractor's responsibility to perform similar routine, necessary, and customary testing and inspection of the methods and frequency suitable for the type of work involved.

3.12 OWNER TESTING AND INSPECTION (T&I)

- A. The Owner will perform testing and inspection as specified in Appendix B (02320).

END OF SECTION



## SECTION 03310 – STRUCTURAL CONCRETE AND EXTERIOR CONCRETE SLABS

## PART 1 - GENERAL

## 1.1 SUMMARY

## A. Section Includes:

1. Cast-in-place structural concrete for concrete structures and exterior slabs on grade including the following:
  - a. Footing and stemwalls.
  - b. .
  - c. Steps.
  - d. Concrete curbs.
  - e. Chase wall pit.
  - f. Door stoops.
  - g. Exterior sidewalks adjacent to building and entry slab.
  - h. Drive-thru pharmacy driveway.
  - i.
  - j. Freezer slabs.
  - k. Metal canopy column encasement.
2. Aggregate base below slab.
3. Formwork, shoring, bracing, and anchorage.
4. Reinforcement and accessories.
5. Curing and finishing.
6. Grout, for setting and anchoring items in masonry and concrete.

## B. Related Requirements: The following list is intended to aid in locating work related to or dependent on the scope of Work in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.

1. Section 01351 – Regulatory Compliance.
2. Section 03314- Cast-In-Place Concrete Slabs. Concrete for interior slabs on ground except as specified above.
3. Section 03361 – Color Textured (Stamped) Concrete Finishes.
4. Section 05120 - Structural Steel: Column anchor bolts.
5. Section 05500 - Metal Fabrications: Other metal components cast into concrete.
6. Section 07900 - Joint Sealers: Expansion, Contraction, and Construction Joint Fillers and Sealants.
7. Appendix B – Testing, Inspection and Observation by Owner: Procedures for inspection, testing, and documentation by Owner furnished testing laboratory.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. Mandatory Provisions: In publications referred to herein, advisory provisions shall be considered to be mandatory.
- C. American Association of State Highway and Transportation Officials (AASHTO): Standard Specification For Transportation Materials And Methods Of Sampling and Testing :
  1. AASHTO T318 - Water Content of Freshly Mixed Concrete Using Microwave Oven Drying (Formerly AASHTO TP 23)
- D. American Concrete Institute (ACI):
  1. ACI 117 - Standard Tolerances for Concrete Construction and Materials.
  2. ACI 301 - Structural Concrete.
  3. ACI 304.2R - Placing Concrete By Pumping Methods
  4. ACI 305.1 – Specifications for Hot Weather Concreting.
  5. ACI 306.1 - Cold Weather Concreting

6. ACI 308.1 - Standard Specification for Curing Concrete.
  7. ACI 308R - Guide To Curing Concrete
  8. ACI 347 - Guide To Formwork For Concrete
  9. ACI SP66 - ACI Detailing Manual
- E. ASTM International (ASTM):
1. ASTM A36 – Carbon Structural Steel.
  2. ASTM A82 - Steel Wire, Plain, for Concrete Reinforcement.
  3. ASTM A185 - Steel Welded Wire Fabric, Plain, for Carbon Steel, 60,000 PSI Tensile Strength Concrete Reinforcement.
  4. ASTM A615 - Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
  5. ASTM A706 - Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement
  6. ASTM C33 - Concrete Aggregates.
  7. ASTM C94 - Ready-Mixed Concrete.
  8. ASTM C136 - Sieve Analysis of Fine and Coarse Aggregates
  9. ASTM C150 - Portland cement.
  10. ASTM C171 - Sheet Materials for Curing Concrete.
  11. ASTM C260 - Air-Entraining Admixtures for Concrete.
  12. ASTM C309 - Liquid Membrane-Forming Compounds for Curing Concrete.
  13. ASTM C 403 - Time of Setting of Concrete Mixtures by Penetration Resistance
  14. ASTM C494 - Chemical Admixtures for Concrete.
  15. ASTM C618 - Fly Ash and Raw or Calcined Natural Pozzolan for use as a Mineral Admixture in Portland Cement Concrete.
  16. ASTM C989 - Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars
  17. ASTM C881 - Epoxy-Resin-Base Bonding Systems For Concrete
  18. ASTM C1107 - Packaged Dry, Hydraulic-Cement Grout (Non-Shrink).
  19. ASTM C 1218 - Water-Soluble Chloride in Mortar and Concrete.
  20. ASTM C1315 - Liquid Membrane Forming Compounds Having Special Properties for Curing and Sealing Concrete.
  21. ASTM D 98 - Calcium Chloride.
  22. ASTM D 698 - Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 5.5 lb (2.49 Kg) Hammer and 12-in (305 mm) Drop.
  23. ASTM D1241 - Materials for Soil-Aggregate Subbase, Base and Surface Courses
  24. ASTM D1751 - Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
  25. ASTM D1752: Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.
  26. ASTM D2628 - Preformed Polychloroprene Elastomeric Joint Seals for Concrete Pavements.
  27. ASTM D3575: Standard Test Methods for Flexible Cellular Materials Made From Olefin Polymers.
  28. ASTM E96 - Water Vapor Transmission of Materials
  29. ASTM E154 - Water Vapor Retarders Used in Contact with Earth under Concrete Slabs, on Walls or as Ground Cove.
- F. American Welding Society (AWS):
1. AWS D1.4 - Structural Welding Code Reinforcing Steel.
- G. Concrete Reinforcing Steel Institute (CRSI):
1. CRSI Manual of Standard Practice.
  2. CRSI Placing Reinforcing Bars.
- H. America Plywood Association (APA):
1. Grading Rules.
- I. Department of Commerce (National Institute of Standards and Technology) – Product Standard (DOC):
1. DOC PS 1 - Construction and Industrial Plywood.
- J. International Code Council, Inc.:

1. International Building Code (IBC).
- K. National Concrete Ready-Mix Association:
1. NCRMA Inspection Standards
- L. Occupational Safety and Health Administration (OSHA):
1. OSHA 01926.1153 Respirable Crystalline Silica.
- 1.3 ENVIRONMENTAL REQUIREMENTS
- A. Minimize dust emissions or provide equipment that suppresses dust.
- 1.4 SUBMITTALS
- A. Submittal Procedures: Unless otherwise specified herein, submit in accordance with procedures specified in Section 01330.
- B. Submit all submittals electronically in PDF format via email, unless otherwise specified, to Architect of Record.
- C. Submit submittal items required within this section concurrently. Do not submit submittals of this section together with submittals in section 03314 or any other section. Identify submittals explicitly in accordance with Procedures paragraphs in Section 01330.
- D. Sieve Analysis for Aggregate Base: Submit current sieve analysis report, sampled and tested within the last 60 days of submittal date, for aggregate base and choker material.
- E. Concrete Batch Plant Certifications: Submit name and address of the concrete supplier's batch plant and plant certification(s) by National Ready-Mix Concrete Association and/or State Department of Transportation.
- F. Shop Drawings: Submit shop drawing for field use. Do not use reproductions of Contract Documents as shop drawings. Prepare shop drawings in accordance with Part B, Chapter 3, ACI 315.
1. Reinforcement:
    - a. Include concrete notes on shop drawings that relate to proper placing of reinforcing.
    - b. Show all reinforcing steel including dowels, embedded steel items, and anchor bolts .
    - c. Include number, grade, size, length, mark, location, splice lengths, and bending diagrams for reinforcing steel and related products.
  2. Placement Drawings:
    - a. Submit reinforcement placement drawings with bar lists. Include walls, grade beams, and plans of footings and slabs.
    - b. Show section cuts, details with piece marks, and control joint locations. Show reinforcing size, quantity, spacing, location, length, and required schedules.
- G. Samples: Materials as requested by the Engineer, including names, sources, and descriptions.
- H. Mix Design: Fill out and submit attached Concrete Mix Design Submittal Form. Submit each proposed mix design in accordance with ACI 301, Sections 3.9 "Proportioning on the basis of previous field experience or trial mixture", or 3.10 "Proportioning based on empirical data". Submit separate mix design for concrete to be placed by pumping in addition to the mix design for concrete to be placed directly from the truck chute. Submit mix design by e-mail to the Architect of Record and the Wal-Mart Construction Testing Laboratory. Include applicable information shown on the Mix Design Submittal Form and the following:
1. Proportions of cementitious materials, fine and coarse aggregate, and water.
  2. Water-cementitious material ratio, 28-day compressive design strength, slump, and air content.
  3. Type of cement, fly ash, slag, and aggregate. For troweled interior slabs, do not use fly ash, or other supplementary cementitious materials.
  4. Aggregate gradation.
  5. Type and dosage of admixtures.
  6. Special requirements for pumping.

7. Range of ambient temperature and humidity for which design is valid.
  8. Special characteristics of mix which require precautions in mixing, placing, or finishing techniques to achieve finished product specified.
  9. Materials and methods for curing concrete.
- I. Submit Shop Drawings, and Quality Control Submittals within 5 working days of Contract date.
- J. Attachments to Concrete Mix Design: Submit the following as attachments to be included with the Concrete Mix Design:
1. Cementitious materials mill test reports for the following:
    - a. Portland cement
    - b. Fly ash where required
    - c. Slag where required
  2. Designation, type, quality, and source (natural or manufactured) of coarse and fine aggregate materials.
  3. Sieve Analysis Reports: Provide separate sieve analysis of percentages passing for coarse and fine aggregate. Show values for each sieve size shown on the mix design form. Do not leave any line blank. Sieve analysis sampling and testing for each aggregate source shall be conducted within 60 days of concrete submittal date.
  4. Aggregate Supplier Statement:
    - a. Stating if aggregate is possibly alkali-reactive based on tests or past service.
    - b. Stating if aggregate can possibly cause pop-outs, "D" cracking, or other disruptions due to moisture gain, freezing, or other mechanisms, based on tests or past service.
  5. Product data for the following concrete materials admixtures:
    - a. Water reducing
    - b. Set retarding
    - c. Set accelerating
    - d. Data indicating chloride ion content information for each admixture
  6. Concrete compressive strength data as required by ACI 301.
  7. Past compression test reports on each mix as required by ACI 301.
  8. Concrete Supplier Approval.
  9. Chloride-Ion Content: Measured water-soluble chloride-ion content (percent by weight of cementitious materials) in accordance with ASTM C1218.
  10. Time of Initial Setting: Initial setting time in accordance with ASTM C403.
- K. Product Data: Submit certified laboratory test data or manufacturer's certificates and data for the items listed below certifying that materials are in conformance requirements specified herein. Submit to the Architect of Record and the Construction Testing Laboratory for review and approval and within 7 calendar days after receipt of Notice-to-Proceed.
1. Portland cement concrete mix design(s)
  2. Type and source of Portland cement, fly ash, and slag
  3. Aggregate gradations
  4. Soft preformed joint filler
  5. Pavement joint sealant
  6. Dowel bars
  7. Tie bars
  8. Reinforcing steel bars
  9. Welded wire fabric
  10. Air entraining admixtures
  11. Water-reducing, set-retarding, and set-accelerating admixtures (if used)
- L. Pavement Joint and Placement Plan: Provide a placement plan identifying the following:
1. Concrete truck access location.
  2. Extent of placements including width, length, slab placement area and volume.
  3. Locations of construction joints.
  4. Location of sawn contraction joints if different from those shown on the civil drawings.
- M. Pre-Slab Installation Meeting:

1. Provide record of notification of pre-slab meeting including company name, persons contacted, and date and method of contact.
2. Provide meeting minutes to all participants and Wal-Mart Construction Manager including sign-in sheet.

N. Delivery Tickets:

1. Copies of delivery tickets for each load of concrete delivered to site.
2. Indicate information required by ASTM C 94 on each ticket including additional information required for slabs.
3. Information on ticket shall include quantities of material batched including the amount of free water in the aggregate and the quantity of water that can be added at the site without exceeding the maximum water cementitious ratio of the approved mix design. Aggregate moisture corrections shall be based on ASTM definitions of aggregate moisture content and absorption.
4. Mix identification number on ticket shall match number on submitted and approved mix design.
5. Submit copies to Wal-Mart Testing Laboratory with each concrete delivery.

## 1.5 QUALITY ASSURANCE

A. Codes and Standards: Comply with provisions of following codes, specifications, and standards, except where more stringent requirements are shown or specified:

1. ACI 301 - Specifications for Structural Concrete for Buildings.
2. CRSI - Manual of Standard Practice.

B. Pumped Concrete:

1. Perform mix design, proportioning, and placement in accordance with ACI 304.2R.
2. Submit documented evidence of experience in placing concrete by pumping on not less than three projects of similar size and complexity. List available pump size, standby pump size, piping, and other equipment.
3. Submit documented evidence of concrete supplier's ability to dedicate sufficient mixing and delivery equipment to supply the concrete continuously for the volumes to be placed by pumping.

C. Chemical Admixtures: Set control admixtures may be used only when adverse weather conditions are anticipated. Use of admixtures is subject to Wal-Mart approval.

1. Notify Wal-Mart Construction Manager at Pre-Bid Conference if admixtures will be used in concrete.
2. Provide Wal-Mart Construction Manager with proposed Construction Schedule identifying anticipated adverse weather conditions justifying use of admixtures.
3. Notify Wal-Mart Construction Manager prior to installation for which admixtures will be used in concrete.
4. Mix design shall indicate ingredients including the admixtures to be used and the slump and air content range for the project.

D. Concrete Truck Inspection:

1. Conform to ASTM C94, NRMCA, and Department of Transportation standards in state where project is located.
2. Perform inspections immediately before starting concreting operations.
3. Record acceptable truck numbers.
4. Record the identification numbers of those trucks found to be acceptable on the basis of inspections.
5. Do not bring on site for concreting operations, any truck whose identification numbers are not recorded as acceptable. Notify Wal-Mart Testing Lab if non-conforming trucks are used to deliver concrete for slabs and pavements.

E. Tolerances:

1. Conform to most stringent requirements of ACI 117 and ACI 301 except as specified herein.
2. Conform to ACI 117 thickness tolerances for slabs-on-ground.

F. Finished Surface Flatness and Levelness (For placements larger than 10,000 square feet.):

1. The minimum local area shall be bound on each side by column lines.
2. Sales Floor Interior Floor Slabs: Specified Overall Value (SOV) FF 40 / FL 30 and Minimum Local Value (MLV) FF 28 / FL 20 tolerance for troweled floors in accordance with ACI 117.

3. Non-Sales Floor Interior Floor Slabs: Specified Overall Value (SOV) FF 35 / FL 25 and Minimum Local Value (MLV) FF 24 / FL 17 tolerance for troweled floors in accordance with ACI 117.
  4. Remedies for Out-of-Tolerance Work:
    - a. Remove and replace slabs-on-grade measuring below either (or both) of specified minimum local F-numbers.
    - b. At option of Owner, Contractor may be allowed to submit alternatives for remediation.
  5. Costs for corrective work, remedies for out-of-tolerance work, and extra testing as required by defective work shall be borne by Contractor.
  6. Validate existing elevations where new slab will abut existing. The Contractor must notify the EOR in writing within 48 hours of new concrete installations if the existing elevations will prevent achieving specified surface profile tolerances.
  7. Slab on grade dowels:
    - a. Install dowels within plus or minus (+/-) 1/8" in dowel alignment in vertical and horizontal planes.
    - b. Install dowels horizontally on the bulkhead at the greater depth of either mid-slab or 2-1/4 inch from slab surface to center line of the plate.
- G. Penetrating Hardener/Densifier Installer Qualifications:
1. Minimum of 15 concrete finish applications within last 3 years similar in type and size to Work of this Contract.
  2. Provide letter of certification from the penetrating hardener/densifier manufacturer stating that installer is a certified applicator of the specified concrete finish material and is familiar with proper procedures and installation requirements required by manufacturer.
- H. Concrete Supplier Approval:
1. The concrete supplier shall be fully approved and acceptable by the concrete subcontractor as the producer of concrete for which the subcontractor is to place and finish. Prepare Statement of Approval of Concrete Supplier stating project name, name of concrete supplier, along with the statement of approval and the signatures of the Contractor and concrete pavement subcontractor. Submit statement as specified in Submittals paragraph above.
- I. Workmanship:
1. When directed by the Owner, remove and replace or repair concrete and related Work which does not conform to specified requirements including strength, tolerances and finishes.
  2. Bear cost of corrections or delays to other work affected by, or resulting from, corrections to concrete Work.
  3. If results of compressive strength tests reveal deficiencies in concrete, meet requirements of ACI 301.
  4. Establish and maintain required lines and elevations.
  5. Check surface areas at intervals necessary to eliminate ponding areas.
- J. Pre-installation Meeting: Convene a pre-installation meeting at the site at least two weeks prior to commencing work of this Section. Require attendance of parties directly affecting work of this Section, including, but not limited to, the Owner's representative, CTL's representative and inspector, Contractor, concrete sub-contractor and job foreman, concrete supplier, and base fine grading contractor.
1. Contact Wal-Mart Construction Manager Thirty days prior to pre-installation conference to confirm schedule.
  2. Record discussions of meeting and decisions and agreements (or disagreements) reached, and furnish copy of record to each party attending. Review foreseeable methods and procedures related to paving work, including the following:
    3. CTL's testing and inspection procedures.
    4. Concrete finishes and finishing.
    5. Cold- and hot-weather concreting procedures.
    6. Curing procedures.
    7. Concrete design mixture and examine procedures for ensuring quality of concrete materials.
    8. Proposed sources of concrete materials, including capabilities and location of plant that will manufacture concrete.
    9. Tour, inspect and discuss condition of subgrade, drainage structures, and other preparatory work.
    10. Requirements for protecting concrete work, including restriction of traffic during installation period and for remainder of construction period.

11. Review and finalize construction schedule and verify availability of materials.
12. Concrete paving requirements (drawings, specifications and other contract documents).
13. Required submittals, both completed and yet to be completed.
14. Weather and forecasted weather conditions, and procedures for coping with unfavorable conditions.
15. Safety precautions relating to placement of concrete.
16. Changes to the contract documents from recommendations or discussions at the Pre-Construction meeting shall be approved in writing by the Wal-Mart Construction Manager prior to implementation.

#### 1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in unopened containers with labels identifying contents. Keep containers closed and upright to prevent leakage.
- B. Mark reinforcing, accessories and embedded items for proper identification and placement location.
- C. Store materials, except aggregate, off ground in dry area and in manner to prevent damage. Protect liquid materials from freezing.
- D. Stockpile aggregate in manner to prevent contamination with other materials or with other sizes of aggregates. Conduct tests for determining conformance to requirements at point of batching. Do not use bottom 6" of aggregate piles in contact with ground. Allow sand to drain until it has reached a uniform moisture content before it is used.
- E. Store admixtures in manner to prevent contamination. Protect admixtures from extreme temperatures which would adversely affect their characteristics.

#### 1.7 PROJECT CONDITIONS

- A. Hot and cold weather concreting shall be in accordance with ACI 305.1 (hot weather) and 306.1 (cold weather).
- B. Concreting in Hot, Dry, or Windy Weather:
  1. Employ precautions to avoid cracking when the concrete rate of evaporation exceeds 0.1 pounds per square foot per hour or when any combination of concrete materials and weather conditions are favorable for the formation of plastic shrinkage cracks.
  2. Maintain an accurate reading thermometer at the job site to check temperature of concrete.
  3. Reject concrete if more than one slump adjustment, as defined in ASTM C 94, is required.
  4. Do not place concrete when forms, subgrade, aggregate base, or reinforcing bars are more than 120 F or the temperature differential between the forms, aggregate base, or reinforcing bars and concrete will create conditions favorable for settlement cracks or thermal cracking.
- C. Concreting in Cold Weather:
  1. Mix and place concrete when the air temperature in the shade and away from artificial heat is a minimum of 35 degrees F and rising.
  2. Conform to ACI 306.1 when temperature and other environmental conditions are as noted therein.
  3. Subgrade shall be thawed to depth of 12 inches immediately before placing concrete.
  4. Measure and record concrete temperature during protection period in each placement at regular time intervals, but not less than 3 times per 24 hour period.
  5. Do not place slabs on subgrade or base that is more than 20°F cooler than concrete. Warm subgrade or base to decrease temperature differential to 20 F or less

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Subject to compliance with project requirements, provide products as manufactured by the following to the extent as specified hereinafter for the specific product:
  1. American Colloid Company, (800) 527-9948.
  2. Ardex Engineered Concrete, Aliquippa, PA (888) 512-7339. Contact: Linda Zigman, (312) 218-6893.

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3. A.W. Cook Cement Products, (706) 654-3677.
4. ChemMasters, Inc., (Vexcon), Madison, OH, (440) 428-2105
5. CETCO Mineral Technologies (Colloid Environmental Technologies Co.), Hoffman Estates, IL (800) 527-9948.
6. ChemMasters, Inc. (Vexcon), Madison, OH, (440) 428-2105.
7. CTS Cement Manufacturing Corp., (800) 929-3030.
8. curDayton Superior (and Unitex, Conspec), Dayton, OH (888) 977-9600.
9. Euclid Chemical Co., Cleveland, OH, (800) 321-7628.
10. GCP Applied Technologies, (713) 223-8353.
11. Henry Company (Synko-Flex Products Division); (800) 486-1278.
12. Master Builders Solutions (formerly BASF Admixture/BASF Building Systems, Sonneborn, Degussa, Thoro), Cleveland, OH (800) 628-9990.
13. Reef Industries, (800) 231-6074.
14. Sika Corp., (800) 933-7452.
15. W.R. Meadows, Inc., (847) 214-2100.

B. Substitutions: Not permitted unless otherwise specified.

## 2.2 EXTERIOR PAVEMENT AGGREGATE BASE MATERIALS

A. Exterior pavement areas shall receive aggregate base materials as specified herein unless otherwise shown on the Foundation Subsurface Preparation.

B. Aggregate Base: Use one of the following gradations:

1. Any local state DOT approved road base material with 100% passing No. 1½-inch sieve, 15% to 55% passing the No. 4 sieve and 5% to 12% passing the No. 200 sieve.
2. Material that satisfies the General and Gradation “A”, “C”, or “D” requirements (with the modified allowance of 5% to 12% passing the No. 200 sieve) as defined by ASTM D 1241.
3. Material passing the No. 200 shall be clean granular fill with less than 3% clay and/or friable particles.

C. Aggregate Choker Material: Clean granular fill with less than 3% clay and/or friable particles. Use one of the following gradations:

1. ASTM 448 No. 10 with 6% to 12% passing No. 200 sieve.
2. Material that meets the following gradation:

<u>Std. Sieve Size</u>	<u>% Passing</u>
No. 4	85-100
No. 8	75-95
No. 16	55-75
No. 50	22-45
No. 100	10-30
No. 200	6-12

## 2.3 INTERIOR SLAB AGGREGATE BASE MATERIALS

A. Interior slabs on grade shall receive aggregate base materials as specified herein unless otherwise shown on the Foundation Subsurface Preparation.

B. Aggregate Base Material

1. Upon removal of the existing concrete slab, the existing base material shall be inspected. Only remove and replace existing material if it does not conform to the following requirements.
2. Gradations shall be one of the following.
  - a. Any state DOT approved road base material meeting the following gradation:

<u>Std. Sieve Size</u>	<u>% Passing</u>
1 ½”	100
No. 4	15-55

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- b. Material conforming to the General Requirements and of the Gradation "A", "C", or "D" requirements (with the modified allowance of 5% to 12% passing the No. 200 sieve) as defined by ASTM D 1241.
3. Material passing the No. 200 sieve shall be clean granular fill with less than 3% clay and/or friable particles.

C. Aggregate Choker Material: Clean granular fill with less than 3% clay and/or friable particles. Use one of the following gradations:

1. ASTM 448 No. 10 with 6% to 12% passing No. 200 sieve.
2. Material that meets the following gradation:

<u>Std. Sieve Size</u>	<u>% Passing</u>
No. 4	85-100
No. 8	75-95
No. 16	55-75
No. 50	22-45
No. 100	10-30
No. 200	6-12

## 2.4 FORMWORK

A. Forms: Design, engineer, and construct forms, shores, bracing, and other temporary supports to support loads imposed during construction in accordance with ACI 347. Design under the direct supervision of a licensed Professional Engineer experienced in design of this Work.

1. Plywood: APA Plyform Class 1, complying with DOC PS 1, exterior-grade plywood panels, suitable for concrete forms, 5/8 inch minimum thickness unless otherwise shown or specified, and as follows.
  - a. Plywood for concrete surfaces to be exposed after construction is complete: APA HDO plyform (High Density Overlay) with straight, sealed edges.
  - b. Plywood for concrete surfaces not to be exposed after construction is complete: APA B-B Plyform .
2. Lumber: Dressed, tongue and grooved, free from loose knots.
3. Metal: Smooth, clean, corrosion-free, without dents or holes and with closely-matching edges.
4. Fiberglass: Smooth, clean, without dents or holes and with closely-matching edges.
5. Laminated Round Fiber Tubes: Spirally laminated paper fiber, wax impregnated on exterior surfaces and interior ply allowing uniform moisture penetration.

B. Form Release Agents:

1. 100% biodegradable, non-toxic, 100% natural organic chemical release agent that will not cause surface imperfections, and is non-staining and compatible with field applied paints, toppings, curing compounds and other coatings.
2. Use same brand form release agent for all forms.
3. Products:
  - a. Form-EZE Natural by Euclid Chemical, (800) 321-7628.
  - b. Certi-Vex by ChemMasters.
  - c. Farm Fresh by Unitex/Dayton Superior.

C. Ties and Accessories:

1. Provide form ties, anchors, and hangers of sufficient strength to resist displacement of forms due to construction loads and depositing of concrete.
2. Provide ties and spreader form ties designed so no metal will be within 1 inch of surface when forms are removed.
3. Where concrete surfaces are exposed to view, use form ties that will leave a depression not more than 1 inch in diameter when removed.

D. Waterstops: Provide one of the following.

1. Waterstop RX-101 Bentonite Waterstop, by CETCO (Colloid Environmental Technologies Co.)
2. SF302-Synko-Flex Waterstop, by Henry Co.

## 2.5 REINFORCEMENT

- A. Reinforcing Bars:
  - 1. ASTM A615, deformed, Grade 60.
  - 2. ASTM A 706, deformed, Grade 60.
- B. Joint Dowel Bars: ASTM A 615, Grade 40 minimum, or ASTM A36, smooth round plain-steel bars, cut bars true to length with ends square and free of burrs. Epoxy coat per State Highway Department Standard Specifications.
- C. Welded Wire Mesh: Welded plain cold-drawn steel wire fabric, ASTM A185. Furnish in flat sheets.

## 2.6 REINFORCEMENT ACCESSORY MATERIALS

- A. Tie Wire: Minimum 16 gage annealed type.
- B. Reinforcing Support Devices:
  - 1. Manufacturer support devices of metal (wire bar), concrete, or recycled plastic devices conforming to CRSI Manual of Standard Practice.
  - 2. Plastic accessories shall have a minimum of 50% recycled content.
  - 3. Do not use wood, brick and other devices that can expand due to moisture gain.
  - 4. Precast concrete chairs shall have minimum compressive strength of 3,500 psi.
  - 5. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.
  - 6. When precast concrete bar supports are used over aggregate base, or over waterproof membranes and vapor retarders, properly embed tie wires to prevent penetration of substrate.
  - 7. Properly size foot of bar supports or similar devices to prevent settlement on base material or prevent puncture on vapor barrier.
  - 8. When supporting multiple layers of reinforcement, provide the proper size and spacing of bar supports or similar devices to prevent deformation of plastic and to retain rebar within position tolerances.

## 2.7 CONCRETE MATERIALS

- A. Cement: ASTM C 150 – If reactive aggregates are present in the area, use low alkali cement containing less than 0.6 percent alkalis. Use only one brand throughout project.
  - 1. Required Cement Type based on ACI Exposure Category and Class as noted on Drawings.
    - a. Sulfate Exposure Class S0 – Type I, II, or III.
    - b. Sulfate Exposure Class S1 – Type II or Type III with C<sub>3</sub>A content less than 8%.
    - c. Sulfate Exposure Class S2 – Type V or Type III with C<sub>3</sub>A content less than 5%.
    - d. Sulfate Exposure Class S3 – Type V plus pozzolan or slag cement.
- B. Concrete Aggregate:
  - 1. Conform to ASTM C33.
  - 2. Aggregate shall contain no coal or lignite in concrete that will not be covered by soil.
  - 3. Fine Aggregate:
    - a. Conform to fine aggregate grading requirements as defined in section 6.1 of ASTM C 33 unless approved by the Structural Engineer.
    - b. If manufactured sand is used, blend with minimum 25% natural sand unless otherwise approved by the Structural Engineer.
  - 4. Coarse Aggregate:
    - a) Nominal maximum coarse aggregate size shall be 1 inch for slabs ≤ 5-1/2 inch thick.
    - b) The nominal maximum size of an aggregate is the smallest sieve size through which the major portion of the aggregate must pass, with a minimal amount retained on the maximum sieve size. Maximum 4% shall be retained on the nominal maximum size sieve.
  - 5. Adjust proportions of combined coarse, intermediate, and fine aggregates to provide the following particle size distribution characteristics, unless otherwise approved:
    - a. Coarseness Factor of 60 to 75%.

- 1) The Coarseness Factor (CF) is the percent of combined aggregate retained on the #8 sieve that is also retained on the 3/8" sieve.
  - 2) The Coarseness Factor is calculated as follows:  

$$CF = \text{Aggregate retained on } 3/8'' \text{ sieve} / \text{Aggregate retained on } \#8 \text{ sieve.}$$
  - b. Adjusted Workability Factor
    - 1) The Workability Factor (WF) is the percent of combined aggregate that passes the #8 sieve.
    - 2) The Adjusted Workability Factor (Adj-WF) is calculated as follows:  

$$\text{Adj-WF} = WF + [(\text{Cementitious Material} - 564 \text{ lbs}) / 37.6]$$
    - 3) The range of accepted Adj-WF for a given CF is as follows:  

$$\text{Adj-WF} = [(11.25 - .15 \text{ CF}) + 36] \pm 2.5$$
    - 4) Combined percent retained on any given sieve size shall not exceed 24%.
  6. Gradation requirement of ASTM C33 may be waived in order to meet ranges specified.
- C. Fly Ash: ASTM C618, Type C or F. Use only one type and source throughout the project. For troweled interior slabs, do not use fly ash, slag, or other supplementary cementitious materials.
- D. Slag: ASTM C989, Grade 100 or 120. Use only one type and source throughout the project. For troweled interior slabs, do not use fly ash, slag, or other supplementary cementitious materials.
- E. Water: Clean potable water, not detrimental to concrete.

## 2.8 CHEMICAL ADMIXTURES

- A. Air Entrainment: ASTM C260.
1. Eucon Air Mix or Aucon AEA-92 by Euclid.
  2. MasterAir VR 10, MasterAir AE 90, or MasterAir AE 200 by Master Builders.
  3. Daravaire 1000 or Darex AEA by GCP Applied Technologies.
  4. Sika Air or AEA Series, by Sika.
  5. Equivalent approved products.
- B. Evaporation Retardant: Water-based polymer, sprayable.
1. Euco-Bar, by Euclid
  2. MasterKure ER 50 by Master Builders.
  3. Aquafilm, by Dayton Superior.
- C. High-Range Water Reducing Admixture: ASTM C494, Type F or G.
1. Type F:
    - a. Eucon 37, by Euclid.
    - b. Daracem 100, by GPC Applied Technologies.
    - c. MasterRheobuild 1000 or MasterGlenium Series by Master Builders.
    - d. ViscoCrete, Sikament, or Sikaplast by Sika
  2. Type G:
    - a. Eucon 537, by Euclid.
    - b. Daracem 100, by W.R. Grace.
    - c. Rheobuild 716, by Master Builders.
  3. Equivalent approved products.
- D. Other Admixtures: Additional admixtures including retarding, accelerating, and evaporation retardant, and integral color admixtures are specified in Section 03314.

## 2.9 RELATED MATERIALS

- A. Non-shrink Grout: Pre-mixed non-shrinking, high strength grout, ASTM C1107, Type A, B, or C; compressive strength of 5000 psi in 28 days.
1. NS Grout, by Euclid.
  2. MasterFlow 100 by Master Builders.
  3. Certi-Vex Grout #1000, by Vexcon.

- 4. Enduro 50, by Conspec.
- B. Joint Materials: Specified in Section 07900.
- C. Foundation Perimeter Insulation: Specified in Section 07210.
- D. Epoxy Bonding Agent: ASTM C881
  - 1. Euco #452 by Euclid.
  - 2. Eva-Pox Bonder by Chase Corp.
  - 3. Conesive Liquid (LPL), by Master Builders.
  - 4. Sikadur 32, Hi-Mod LPL by Sika.
- E. Bond Breaker: ASTM D226, No. 15, unperforated asphalt saturated felt.
- F. Leveling Compound:
  - 1. Ardex V-1200, by Ardex. Contact: Linda Zigman, (312) 218-6893.
  - 2. Flo-Top or Super Flo-Top, by Euclid.
  - 3. SikaTop Overlay System, by Sika.
  - 4. Thoro Underlayment Self-Leveling including Thoro Primer #800, by Thoro.
  - 5. Certi-Vex SLU TC including EnvioBond A Primer, by Vexcon.
  - 6. Conflow including Primeflow, by Conspec.
  - 7. MASTERTOP 110 UNDERLAYMENT, by Master Builders.
- G. Concrete Sealer: Solvent based concrete sealer having a minimum 25% solids similar to High Solids Clear Seal manufactured by Increte Systems Inc.

## 2.10 CONCRETE CURING MATERIALS

- A. Water: Clean, clear, and potable, not detrimental to concrete finish.
- B. Concrete Curing Cover:
  - 1. Filter Concrete Curing Covers and Slab Floor Protection by Reef.
  - 2. Ultracure by McTech Group.
- C. Liquid Membrane Curing and Sealing Compound: ASTM C 1315, Type I, Class A or B, 25% minimum solids content, clear non-yellowing with no styrene-butadiene.
  - 1. Water Based, VOC less than 350 g/l:
    - a. Super Aqua Cure VOX, by Euclid Chemical Corp.
    - b. MasterKure CC 1315WB by Master Builders Solutions.
  - 2. Solvent Based
    - a. Super Rez-Seal, by Euclid Chemical Corp.
    - b. MasterKure CC 300SB by Master Builders Solutions.
- D. Dissipating Curing Compound: ASTM C 309 Type 1, Class A or B, solvent or water base, VOC less than 350 g/l.
  - 1. Clear Resin Cure J11W or Safe Cure & Seal 309 J18 by Dayton Superior. (Water Base)
  - 2. Kurez DR VOX, by Euclid. (Water Base)

## 2.11 COLOR TEXTURED (STAMPED) CONCRETE

- A. Color textured concrete is specified in Section 03361.

## 2.12 CONCRETE MIX

- A. Mix and deliver concrete in accordance with ASTM C94. Prepare design mixes for each type and strength of concrete by the laboratory trial batch or the field experience method as specified in ACI 301.

- B. ACI Exposure Category and Class: ACI freeze/thaw and sulfate exposure category and class shall be as indicated on Drawings. Exposure class with highest compressive strength and lowest maximum water cementitious material ratio shall take precedence for each mix.
- C. Structural Concrete Footings:
1. Compressive Strength: Strength at 28 days shall be as follows unless otherwise indicated on the Drawings:
    - a. Exposure Class F0, F2, F3, or S0: 3,000 psi
    - b. Exposure Class S1: 4,000 psi
    - c. Exposure Class S2 or S3: 4,500 psi
  2. Maximum Water-Cementitious Material Ratio (Cement Quantity Includes Fly Ash or slag):
    - a. Exposure Class F0, F2, F3, S0 or S1: 0.50 by wt.
    - b. Exposure Class S2 or S3: 0.45 by wt.
  3. Slump: Slump at the point of placement shall not exceed 5 inches and shall be of a consistency to be worked readily into forms and around reinforcement without segregation, voids, or excessive bleeding. Maximum slump variance shall be 2 inches.
  4. Air Content: Do not air-entrain unless required for concrete workability. Not to exceed 5.0 percent.
- D. Structural Concrete Formed Walls:
1. Compressive Strength: Strength at 28 days shall be as follows unless otherwise indicated on the Drawings:
    - a. Exposure Class F0 or S0: 3,500 psi
    - b. Exposure Class S1: 4,000 psi
    - c. Exposure Class F2, S2 or S3: 4,500 psi
    - d. Exposure Class F3: 5,000 psi
  2. Maximum Water-Cementitious Material Ratio (Cement Quantity Includes Fly Ash or slag):
    - a. Exposure Class F0, S0 or S1: 0.50 by wt.
    - b. Exposure Class F2, S2 or S3: 0.45 by wt.
    - c. Exposure Class F3: 0.40 by wt.
  3. Slump: Slump at the point of placement shall not exceed 5 inches and shall be of a consistency to be worked readily into forms and around reinforcement without segregation, voids, or excessive bleeding. Maximum slump variance shall be 2 inches.
  4. Air Content: As specified in the Table below.
- E. Non-Structural Exterior Concrete Pavement and Slabs on Grade:
1. Compressive Strength: Strength at 28 days shall be as follows unless otherwise indicated on the Drawings:
    - a. Exposure Class F0 or S0: 3,500 psi
    - b. Exposure Class S1: 4,000 psi
    - c. Exposure Class F2, F3, S2 or S3: 4,500 psi
    - d. Compactor pad (All exposures): 5,000 psi.
  2. Maximum Water-Cementitious Material Ratio (Cement Quantity Includes Fly Ash or slag): 0.45 by wt.
    - a. Exposure Class F0, S0 or S1: 0.50 by wt.
    - b. Exposure Class F2, F3, S2 or S3: 0.45 by wt.
    - c. Compactor pad (All exposures): 0.40 by wt.
  3. Slump Range: 2"- 4" for hand placed concrete, 1-1/4" to 3" for machine placed (slipform) concrete. Maximum slump variance shall be 2 inches.
  4. Air Content: As specified in the table below.
- F. Non-Structural Interior Concrete Curbs and Equipment Pads:
1. ACI Exposure Class: All Classes.
  2. Compressive Strength: Strength at 28 days shall be 3500 psi unless otherwise shown or specified.
  3. Maximum Water-Cementitious Material Ratio (Cement Quantity Includes Fly Ash or slag): 0.55 by wt.
  4. Slump: Slump at the point of placement shall not exceed 5 inches subject to the requirement that concrete shall be of a consistency to be worked readily into forms and around reinforcement without segregation, voids, or excessive bleeding. Maximum slump variance shall be 2 inches.
  5. Air Content: Do not air-entrain interior concrete.
- G. Interior Concrete Slabs on Grade:
1. ACI Exposure Class: All Classes.

2. Compressive Strength: Strength at 28 days shall be 4,000 psi unless otherwise shown or specified.
3. Maximum Water-Cement Material Ratio: 0.55 maximum by wt.
4. Slump: Slump at the point of placement shall not exceed 6 inches. Maximum slump variance shall be  $\pm 1$  inch.
5. Air content: Do not air-entrain interior floor slabs.
6. Measure and mix ingredients in accordance with most stringent requirements of ASTM C94.
7. Ready Mix supplier may proportion materials by field experience or proportion concrete materials by laboratory trial batches per ACI 301 for strength compliance.
8. Submit copies of data and test results to Wal-Mart Construction Manager and Structural Engineer for review to verify mix designs. Workability: Concrete shall be of a consistency to be worked readily into forms and around reinforcement without segregation, voids, or excessive bleeding.
9. Minimum Cement Content: 560 lbs/cy
10. Admixtures:
  - a. Water-reducing admixture may be added to improve workability for desired minimal water content.
  - b. Use admixtures in accordance with manufacturer's recommendation.
11. Do not use fly ash, slag, or other supplementary cementitious materials.

H. Other Structural Concrete (Applies to concrete structures not listed in sections above):

1. Where concrete is not in contact with soil, backfill or base material, the sulfate exposure requirement can be disregarded.
2. Compressive Strength: Strength at 28 days shall be as follows unless otherwise indicated on the Drawings:
  - a. For Concrete Not Exposed to Weather: Min 3,500 psi
    - 1) Exposure Class S0: 3,500 psi
    - 2) Exposure Class S1: 4,000 psi
    - 3) Exposure Class S2 or S3: 4,500 psi
  - b. For Concrete Exposed to Weather:
    - 1) Exposure Class F0 or S0: 3,500 psi
    - 2) Exposure Class S1: 4,000 psi
    - 3) Exposure Class F2, S2 or S3: 4,500 psi
3. Maximum Water-Cementitious Material Ratio (Cement Quantity Includes Fly Ash or slag):
  - a. For Concrete Not Exposed to Weather: Min 0.50 by wt.
    - 1) Exposure Class S0 or S1: 0.50 by wt.
    - 2) Exposure Class S2 or S3: 0.45 by wt.
  - b. For Concrete Exposed to Weather:
    - 1) Exposure Class F0, S0 or S1: 0.50 by wt.
    - 2) Exposure Class F2, S2 or S3: 0.45 by wt.
    - 3) Exposure Class F3: 0.40 by wt.
4. Slump: Slump at the point of placement shall not exceed 5 inches subject to the requirement that concrete shall be of a consistency to be worked readily into forms and around reinforcement without segregation, voids, or excessive bleeding. Maximum slump variance shall be 2 inches.
5. Air Content:
  - a. For Concrete Not Exposed to Weather: Not to exceed 5.0 percent.
  - b. For Concrete Exposed to Weather: As specified in the Table below plus or minus 1.5 percent.

I. Concrete Mix Air Entrainment: Where an exterior concrete mix is noted to be air entrained, the air entrainment shall be as follows:

Nominal Maximum Size Aggregate (Inch)	Average Air Content (%) +/- 1.5% By Exposure Class	
	Class F0	Class F2 & F3
3/8	4.5	7.5
1/2	4.0	7.0
3/4	3.5	6.0
1	3.0	6.0
1-1/2	2.5	5.5

- J. Concrete to be Placed by Pumping Methods:
- a. The minimum quantity of constituent materials passing the No. 50 sieve (fine aggregate and cementitious materials) shall be 600 pounds per cubic yard.
  - b. The particle size distribution of the combined fine and coarse aggregate shall be uniform from the largest to the smallest particles.
- K. Admixtures:
1. Use water-reducing admixture or high-range water-reducing admixture (Superplasticizer) in concrete as required for placement and workability. Unless otherwise permitted herein, chemical admixtures shall be dispensed at the batch plant. Use high-range water-reducing admixture (HRWR) in pumped concrete.
  2. Use air-entraining admixture in exterior concrete exposed to weather. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having total air content specified above.
  3. Use admixtures for water reduction and set control (accelerators and retarders) in strict compliance with manufacturer's directions.
  4. Verify with the admixture manufacturer the following:
    - a. The compatibility of the individual admixtures when combined in the concrete mix.
    - b. The compatibility of the individual admixtures with the concrete materials.
- L. Supplementary Cementitious Materials (SCM):
1. Concrete mix shall contain SCM at the amounts specified unless other amounts are approved by the Structural Engineering Consultant. Either fly ash or ground granulated blast furnace slag (GGBFS) may be used for the SCM but shall not be used together to form a ternary mix. Use of fly ash or GGBFS in the concrete mix is mandatory.
  2. Fly Ash: Substitute fly ash for Portland cement at 20% of the total cementitious content.
    - a. If used to mitigate potential aggregate reactivity, up to 25% fly ash substitution for Portland cement may be used. Only Type F fly ash may be used and shall have the following maximum properties: 1.5% available alkali and 8.0% CaO. When a maximum of 25% replacement is used, up to 10.0% CaO is permitted.
  3. Ground Granulated Blast Furnace Slag (GGBFS): Substitute GGBFS for Portland cement at 25% of the total cementitious content.
    - a. If required to mitigate potential sulfate exposure or aggregate reactivity, up to 50% GGBFS substitution for Portland cement may be used.
  4. Maintain air-entrainment at specified levels.
  5. In cold weather, provide adequate concrete strength gain so concrete will not be damaged from traffic and loads of use.
  6. For troweled interior slabs, do not use fly ash, slag, or other supplementary cementitious materials.
- M. Calcium Chloride Admixture:
1. Calcium chloride (Type L) conforming to ASTM D98 may be used in solution form as part of the mixing water to accelerate concrete setting and early-strength development.
  2. Amount of calcium chloride added shall not be more than necessary to produce the desired results and shall not exceed 2% by weight of cement.
  3. The dosage range for the calcium chloride for the entire project shall not vary by more than 1%. Range is defined as the difference between the maximum and minimum dosages of calcium chloride for the entire project.
  4. Calcium chloride shall not be used in the following applications unless approved by the Structural Engineer:
    - a. Concrete containing embedded dissimilar metals or aluminum
    - b. Slabs supported on permanent galvanized steel forms
    - c. Concrete exposed to deicing chemicals
    - d. Prestressed or post-tension concrete
    - e. Concrete containing aggregates with potentially deleterious reactivity and concrete exposed to soil
    - f. Concrete exposed to soil or water containing sulfates.
  5. Use calcium chloride in accordance with manufacturer's recommendation.
  6. Chloride-ion Concentration: Maximum water-soluble chloride-ion concentrations in hardened concrete at ages from 28 to 42 days contributed from the ingredients including water, aggregates, cementitious material, and admixtures shall not exceed the following limits unless approved by the Structural Engineer:

- a. Type of Member Maximum water-soluble chloride ion (Cl-) content in concrete (percent by weight of cement)
  - 1) Prestressed concrete - 0.06
  - 2) Reinforced concrete exposed to chloride in service - 0.15
  - 3) Reinforced concrete that will be dry or protected from moisture in service - 1.00
  - 4) Other reinforced concrete construction - 0.30
- 7. When using calcium chloride or other admixtures containing chlorides, measure water-soluble chloride-ion content (percent by weight of cementitious materials) per ASTM C 1218. Sample shall be from concrete representing the submitted mix design and maximum chloride dosage anticipated for the project.

## 2.13 MIXING

- A. Ready-Mixed Concrete:
  - 1. Mix and transport in accordance with ASTM C 94 and ACI 301 except as specified.
  - 2. Reset drum revolution counter to zero on ready mix concrete truck when water is added to drum.
- B. Site-Mixed Concrete:
  - 1. Conform to ACI 301.
  - 2. Use central-mix type batch plant.
- C. Proportion concrete materials on basis of field experience or by laboratory trial batches.
- D. Ready-mix concrete supplier may proportion materials by field experience.
- E. Proportioning by Water-Cement ratio is not acceptable.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify anchors, seats, plates, reinforcement, and other items to be cast into concrete are accurately placed, held securely, and will not cause hardship in placing concrete.

### 3.2 PREPARATION

- A. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent. Use proper dust control methods. Apply bonding agent in accordance with manufacturer's instructions.
- B. Preplacement Inspection: All trades and participants involved shall verify that preparations are in conformance with Contract documents. Inspect reinforcement, inserts, and embedded parts before beginning concrete placement to ensure accurate size and location. Use approved sign-off forms.
- C. Notify Wal-Mart Testing Laboratory minimum 48 hours prior to commencement of concreting operations
- D. Cleaning Equipment: Remove hardened concrete and foreign materials from mixing and conveying equipment.
- E. Ensure that all work is properly coordinated:
  - 1. Structural Drawings and Specifications with those of other disciplines.
  - 2. Use final corrected Shop Drawings, placing Drawings and material / equipment Drawings

### 3.3 AGGREGATE BASE PLACEMENT

- A. Where exterior pavement areas are shown on the drawings referencing the "Foundation Subsurface Preparation" for base preparation, place aggregate base in accordance with requirements herein.
- B. Aggregate Base:
  - 1. Install aggregate base where shown on Drawings.



2. Compact to final thickness shown in layers not exceeding 6 inches with minimum of 2 passes per layer with vibratory compactor.
  3. Compact fill to 98% of aggregate's Standard Proctor as determined by Method D of ASTM D698.
  4. Leave pad up to 2 inches low until just prior to concrete placement.
- C. Aggregate Base Fine Grading:
1. Compact to final thickness noted with 2 passes minimum vibratory compactor to produce smooth, flat, dense surface.
  2. Aggregate choaker coarse or top 2" DOT approved road base shall be place dry immediately before placing concrete.
  3. Do not allow excess moisture or soft soil beneath vapor retarder at time of placing concrete.
  4. Thickness shall not exceed 2 inches.
  5. Level off aggregate base top surface with aggregate chocker coarse material as necessary as follows:
    - a. to reduce surface friction and to meet specified fine grade tolerances specified below. Typically required up to 3/4" thick in areas exposed to rain, traffic, or excavation for pits and buried utilities.
    - b. where aggregate base material does not have sufficient fine particles to produce a surface that is free of exposed aggregate or surface voids greater than 3/8" in size at time of slab installation.
  6. Use laser guided equipment used to establish specified base elevation.
  7. Provide dry, smooth, flat, dense surface
  8. Proofroll 48 hrs maximum prior to concrete placement. Depression under a fully loaded ready mix truck shall not exceed 1/2 inch.
- D. Pavement Aggregate Base Fine Grade Tolerance: +0 inch, -3/4 inch with transition no greater than 3/4 inch vertically to 8 inches horizontally for level slab.
- E. Interior Slab on Ground Aggregate Base Fine Grade Tolerance: +0 inch, -3/4 inch with transition no greater than 3/4 inch vertically to 8 inches horizontally for level slab.

### 3.4 FORMWORK

- A. Form vertical surfaces of concrete work.
- B. Design, construct, erect, support, and remove formwork and related items in accordance with most stringent requirements of ACI 117, 301, 304R, and 347R
1. Camber forms to allow for deflection due to weight of fresh concrete.
- C. Formwork for concrete surfaces to be painted or exposed to view after completion of project shall conform to the following:
1. Do not use forms with dents, holes or patches.
  2. Individual formwork elements shall be as large as possible.
  3. Position individual formwork elements in regular, uniform pattern with joints aligned.
  4. Uniformly space and align form ties in horizontal and vertical rows.
  5. Construct forms for removal without hammering or prying against concrete.
  6. Temporary formwork openings (for cleaning, inspecting, etc) shall be placed on unexposed side or constructed so that concrete surface at opening will match adjacent concrete in appearance.
- D. Form Preparation
1. Clean formwork.
  2. Remove rust from steel formwork.
- E. Erecting Forms:
1. Solidly butt joints and provide backup at joints as required to prevent leakage of cement paste.
  2. Do not tape formwork joints.
  3. Just before placing concrete, clean forms and adjacent surfaces again as necessary. Remove wood, sawdust, chips dirt and other debris.
  4. If necessary to grease tie threads, do not allow grease to contact remainder of tie when wall will be exposed to hydrostatic pressure.

- F. Form Release Agent
  - 1. Before placing reinforcing steel, thoroughly coat contact surfaces of forms with an approved form release agent.
  - 2. Apply form release agent evenly without excess drip.
  - 3. Do not allow form release agent to come into contact with concrete surfaces against which fresh concrete will be placed.
  - 4. Moisten wood forms immediately before placing concrete where form release agents are not used.
  
- G. Form Construction for Paving:
  - 1. Set forms to required grades and lines, rigidly braced and secured.
  - 2. Install sufficient quantity of forms to allow continuance of work and so that forms remain in place minimum of 24 hours after concrete placement.
  - 3. Check completed formwork for grade and alignment to following tolerances:
    - a. Top of forms not more than 1/8-inch in 10'-0".
    - b. Vertical face on longitudinal axis, not more than 1/4-inch in 10'-0".
  - 4. Clean forms after each use and coat with form release agent as often as required to ensure separation from concrete without damage.

### 3.5 PLACING REINFORCEMENT

- A. Place reinforcing in accordance with most stringent requirements of ACI 117, 301 and 308 and CRSI Manual of Standard Practice and Placing Reinforcing Bars.
  
- B. Accurately place and secure reinforcement against displacement by firmly wiring at intersections and splices with not less than No. 18 U.S. Standard Gauge annealed wire.
  
- C. Perform concrete reinforcement work in accordance with CRSI Manual of Standard Practice, Documents 63 and 65. Detailing practices and fabrication shall conform to ACI SP66.
  - 1. Place and secure saddle ties at every other intersection with wire; hold in place with metal chairs or spacers during placing of concrete.
  - 2. Hold bars in beams and slabs to exact location during concrete placement. Use spacers, chairs, or other necessary supports with the following tolerances:
    - a. Bars in Slabs and Beams:
      - 1) Members 8 Inches Deep or Less:  $\pm 1/4$  inch.
      - 2) Members 8 Inches to 2 Feet Deep:  $\pm 1/2$  inch.
      - 3) Members more than 2 Feet Deep:  $\pm 1$  inch.
    - b. Lengthwise of Member:  $\pm 2$  inches.
    - c. Concrete Cover to Formed Surfaces:  $\pm 1/4$  inch.
    - d. Minimum Spacing Between Bars:  $\pm 1/4$  inch.
  
- D. Turn wire ends away from concrete exterior.
  
- E. Ensure reinforcing is clean, free from defects and kinks, loose mill or rust scale or coatings that will reduce bond.
  
- F. Protect exposed reinforcing bars, inserts and plates intended for bonding with future expansion from corrosion.
  
- G. When welding of reinforcement is specified, comply with AWS D1.4. Do not tack weld crossing bars for assembly of reinforcement, supports or embedded items.
  
- H. Slab on Grade and Pavement Dowels:
  - 1. Secure dowels and their sleeves perpendicular to joint and parallel to finished concrete surface.
  - 2. Use prefabricated dowel supports at ends of dowels to maintain alignment.
  - 3. Dowel alignment shall be within specified tolerances.
  - 4. Do not grease plate dowels

### 3.6 EMBEDMENTS

- A. Install anchor bolts and embedded bearing devices provided by others.
- B. Provide other anchor bolts and bearing devices shown on Drawings or anchor bolt setting plans or required equipment installation.
- C. Use templates as required for spacing between anchor bolts and set elevations with surveying equipment.
- D. Position and anchor steel shapes, anchor bolts, casings, conduit sleeves, masonry anchorages and other materials embedded in concrete.
- E. Place and secure against displacement miscellaneous steel, pipe sleeves, inserts, anchors, stair abrasive nosings, preformed joint fillers, vapor retarders and miscellaneous embedded items.
- F. Secure embedments to formwork when possible.
- G. Install clean embedments. After concrete placement, clean embedment exposed surfaces of concrete splatter and other foreign substances.
- H. Unless noted otherwise on the Drawings, ensure corner protection angles, bars and other similar embedded metal items are continuous between concrete joints. If shorter lengths are required for metal items, connect the ends by butt-welding entire joint and grinding smooth exposed surface. Ensure embedded metal items are discontinued at construction, contraction and isolation joints.
- I. Temporarily fill voids in sleeves and inserts with easily removable materials.
- J. Before placing concrete on grade, piping and other utilities under concrete shall be inspected, tested, and excavations backfilled and properly compacted to solid bearing.
- K. Allow sufficient time between erection of forms and placing concrete for other trades to install and test their work.

### 3.7 JOINTS

- A. Joints
  - 1. Provide construction, isolation and contraction joints as indicated on Drawings and as noted below.
  - 2. Bulkheads for construction joints shall be 1-1/2 inch minimum lumber. Do not use permanent preformed metal bulkheads.
  - 3. Provide bulkheads full depth of member.
  - 4. Space joints to allow one continuous placement between bulkheads.
  - 5. Ensure saws are equipped with HEPA-filtered dust collection vacuum systems as specified herein.
- B. Contraction Joints:
  - 1. Unless otherwise shown on the Drawings, do not extend reinforcement, corner protection angles, bars or other fixed metal items through construction joints or contraction joints in slabs on ground or pavements or through joints between slabs on ground and vertical surfaces.
  - 2. Match joints in walls and curbs with joints in slabs on ground and pavements.
  - 3. Extend joints across tops of walls and curbs unless noted otherwise on Drawings.
- C. Pavement Joint Construction: Construct weakened-plane control (contraction), and construction joints straight with face perpendicular to concrete surface. Construct transverse joints perpendicular to centerline, unless otherwise detailed.
  - 1. Weakened-Plane Control or Contraction Joints: Provide joints at spacing of 12'-0" on centers, maximum each way. Construct control joints for depth equal to at least 1/4 of the concrete thickness, as follows:
    - a. Form tooled joints in fresh concrete by grooving top with recommended tool and finishing edge with jointer.
    - b. Sawed Contraction Joints:
      - 1) Use saws, blades, skid plates, and accessories by Soff-Cut International, Inc., (800) 288-5040, or approved equal.

- 2) Provide at least two Soff-Cut saws with blades capable of achieving the required depth of saw cut.
  - 3) Start cutting sawed joints as soon as concrete has hardened sufficiently to prevent raveling or dislodging of aggregates. This will typically be from 1 hour in hot weather to 4 hours in cold weather after completing finishing of slab in that joint location.
  - 4) Extend sawed joint to the slab boundaries and abutments, including columns, drains, and other penetrations in the path of a defined joint. Implement methods and timing of the saw cut beyond the limits of the Soff-Cut saw reach to provide a consistent depth of cut with minimal raveling of joint edges.
- c. Saw-Cut Control Joint Dust Collection: Connect one of the following dust collection systems directly to each Soff-Cut saw being used. Select collection system model recommended by the manufacturer to maintain dust emissions at the lowest permissible level for the size of the Soff-Cut blade.
- 1) Pulsevac Dust Collector by E. G. Enterprises
  - 2) ProVac Dust Collection System by [GladTech, Inc.](#), (614) 251-8111.
  - 3) SoffVac by Soff-Cut International, Inc.
2. Construction Joints: Place construction joints at end of placements and at locations where placement operations are stopped for period of more than 1/2 hour. Construct joints in accordance with details shown.
- a. Soft Preformed Joint Fillers: Extend preformed joint fillers full-width and depth of joint, and not less than 1/2-inch or more than 1-inch below finished surface. Furnish preformed joint fillers in 1-piece lengths for full width being placed, wherever possible. Where more than 1 length is required, lace or clip preformed joint filler sections together in a single plane.
  - b. Joint Sealants: Install joint sealants in accordance with manufacturer's recommendations.
- D. Doweled Joints: Install dowel bars and support assemblies at joints as indicated. Make provision to prevent concrete bonding to one side of joint by methods shown on the drawings.

E. Joint filling and sealing is specified in Section 07900.

### 3.8 CONVEYING

- A. Handle concrete from mixer to place of final deposit as rapidly as practicable and in manner which will assure obtaining specified quality of concrete.
- B. Retempering: Discard concrete which has already begun to set. Do not retemper with water.
- C. Equipment: Provide mixing and conveying equipment of proper size and design to ensure a continuous flow of concrete to delivery end. Do not use aluminum pipe or equipment in contact with concrete.
1. Mixers, agitators and non-agitating units: Conform to ASTM C 94 and current certification requirements of Department of Transportation in state where concrete plant is located.
  2. Belt Conveyers:
    - a. Use only types which will not cause segregation.
    - b. Discharge runs over 30 feet into hopper.
  3. Chutes: Metal or metal lined not to be installed at slopes greater than 1 vertical to 3 horizontal.
  4. Runways:
    - a. Provide runways or other means above finished concrete level for wheeled conveying equipment.
    - b. Do not support runways on reinforcing.
    - c. Do not wheel equipment directly over reinforcing or metal deck.
  5. Pumps:
    - a. Submit to Testing Lab Agency for review, changes to concrete mix to necessitate pumping.
    - b. Use pump hoses and other slickline components with 5 inch minimum inside diameter.
    - c. For slickline reducers, reduction in diameter shall not exceed 1 inch over a 5 foot length.

### 3.9 PLACING CONCRETE

- A. Place concrete in accordance with ACI 301; including hot and cold weather placement procedures.

- B. Inspect reinforcement, inserts, and embedded parts before beginning concrete placement to verify accurate size and location.
- C. Ensure reinforcement, inserts, embedded parts and formed joints are not disturbed during concrete placement.
- D. Place concrete in uniform layers, horizontal, 12 to 18 inches thick, exercising care to avoid vertical joints or inclined planes. Place concrete continuously between predetermined construction joints shown on structural drawings. Piling up of concrete in forms to cause separation or loss of ingredients is not permitted.
- E. Do not deposit concrete which has partially set or hardened. Do not deposit initial lubricating mortar when pumping concrete. Remove hardened or partially hardened concrete which has accumulated on forms or reinforcement. Do not place concrete on previously deposited concrete which has hardened sufficiently to cause formation of seams or planes of weakness within respective member or section except as specified.
- F. Deposit concrete as nearly in final position as practical to avoid rehandling. Exercise care to prevent splashing forms or reinforcing with concrete. Do not permit concrete to drop freely a distance greater than 3 feet. Where longer drops are necessary, use chute, tremie, or other conveyance to help avoid separation.
- G. Do not deposit concrete into excavation where water is standing. If place of deposit cannot be successfully pumped dry, place through tremie with outlet end near bottom of place of deposit.
- H.
- I. The following personnel shall be present during all slab placements: Contractor's Superintendent, Concrete Subcontractor's Finish Foreman, Concrete Supplier's Quality Control Representative, and Owner's Construction Testing Laboratory.
- J. Deliver concrete from only one concrete batch for any given days placement. The same concrete plant shall be used for the entire interior slab placements unless approved in writing prior to change
- K. Do not place concrete over standing water, mud, frost, ice or snow.
- L. Do not use wet screeds.
- M. Consolidation:
  1. Consolidate concrete complying with ACI 301 by vibrating, spading or rodding so that concrete is thoroughly worked around reinforcing.
  2. Do not insert vibrator into portions of concrete that have begun to set.
  3. Keep spare vibrator on job site during concrete operations.
  4. Consolidate and screed slabs to allow construction joint pattern as indicated on Structural Drawings and as specified. Consolidate concrete by vibrating laser screeds. Other vibratory screeding methods are acceptable only in areas where laser screed is not accessible.
    - a. Check laser screed level head a minimum of 3 times during each pour. Use feeler gauge to measure deviations. If deviations are present, replace head with a new straight one.
  5. Use internal vibration along construction joints at both formed and slab abutments. Vibrate under plate dowels. Mark forms before concreting to properly locate dowels after concreting.
  6. Do not use grate tampers, jitterbugs, or mesh rollers.

### 3.10 FLOOR SLAB FINISHING

- A. Equipment:
  1. Provide a minimum of five, eight foot or larger, properly operating, ride-on finishing machines on site and available for slab placements.
- B. General:
  1. Do not add water to any slab surface during finishing operations.
  2. Do not add cement to any slab surface during finishing operations.

3. Perform no finishing operation while water is present on slab surface.
- C. Initial Leveling:
1. Complete bull floating, darbying and straight-edging before any bleed water is present on slab surface.
  2. Use a 10 feet wide minimum channel float for initial and later leveling instead of bull float where overall floor tolerances specified are greater than FF 20 / FL15.
- D. Hand and Power Floating:
1. Do not start floating until following conditions are met:
    - a. Bleeding is complete and water is gone, including water sheen on slab surface.
    - b. Mortar is not thrown by rotating blades of power float.
  2. The finisher shall determine the proper time to start finishing procedures for interior slab placements on the basis the above conditions. It is noted for advisory purposes, however, that typical setting characteristics of concrete materials will allow for initial power floating to begin 3-1/2 hour's  $\pm$  1 hour after initial strike-off (screeding), at which time the concrete should support a finisher on foot without more than approximately a 1/4 inch indentation in the slab surface. Variations in concrete materials, nature, and concrete temperature will cause setting behavior to vary.
  3. Do not use following tools for floating:
    - a. Power troweling machines with trowel blades.
    - b. Fresno or other type of wide metal trowel.
    - c. Power floating machine with water attachment for wetting concrete.
  4. Float three times minimum with each floating at right angles to previous floating, and final pass at 45 degrees to previous pass.
- E. Troweling for Interior Slabs:
1. Hand or power float floor before starting troweling.
  2. For first troweling, keep blade as flat as possible and use low speed, minimizing "washboard" or "chatter marks" and "pitting".
  3. Trowel two times minimum with first two trowelings at right angles. Some burn marks are acceptable as determined in review of the test slab. Cease troweling before trowel blades scratch surface.
  4. Allow time between trowelings for concrete to stiffen and water sheen to disappear.
  5. Do not add water to slab surface during troweling.
  6. Do not ride trowels on existing hardened concrete slabs. Trowels shall be carried off of slab surfaces. When parking power trowels on fresh concrete, place on top of plywood or spray area with evaporation retarder before placing trowel on top of slab.
  7. Ensure kneeboard impressions, trowel marks or chattered areas are not evident after floor is finished.
  8. Provide dense, smooth trowel surface, uniform in texture. Random, mottled burn marks are desired and acceptable. Refer to approved permanent test panel.
  9. Finish surface to produce maximum sheen free of scratches and trowel marks.
- F. Do not deposit concrete when plasticity, measured by slump test, is outside specified limits. The addition of water to increase slump will not be permitted.
- G. Vibration: As soon as concrete is deposited, thoroughly agitate with mechanical vibrators and suitable hand tools to work mixture into corners of forms and around reinforcing and embedded items. Use mechanical vibrators with minimum frequency of 9000 revolutions/minute. Do not over vibrate or use vibrators to transport concrete within forms. Insert and withdraw vibrators at approximately 18 inches apart. At each insertion, vibrate generally 5-15 seconds, sufficient to consolidate concrete but not long enough to cause segregation. Keep spare vibrator on job site during concrete placement operations. Do not insert vibrator into lower courses that have begun to set.
- H. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Wal-Mart Construction Manager upon discovery.
- I. Pumping: Maintain controls for proportioning, mixing, adjustment of mix, and placement in accordance with ACI 301 and ACI 304.2R

### 3.11 CURING

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- A. General:
  - 1. Cure concrete in accordance with ACI 301, ACI 308R and ACI 308.1, except as noted.
  - 2. Start curing as soon as concrete surface will not be damaged by curing operations.
  - 3. Continuously cure concrete for at least 7 consecutive days.
  - 4. During curing period, do not allow any part of the concrete to become dry.
  - 5. If using forms for curing, keep forms in contact with concrete wet during curing period unless type of form is impervious to water, such as metal or fiberglass.
  - 6. If forms are removed before curing period is complete, continue curing immediately with other approved methods
  
- B. Methods of Curing:
  - 1. Impervious Sheet Cure: Wet exposed surfaces of concrete after completing finishing and then apply prewetted sheet with edges lapped 6 inches minimum and sealed & secured in such manner as to prevent moisture from escaping from concrete from laps or edges. Remove sheets after a 7 day curing period.
  - 2. Curing Compound:
    - a. Apply liquid curing compounds by spraying or rolling uniformly in a single coat on surfaces immediately following final finishing operation.
    - b. Apply curing compound in accordance with manufacturer's recommendations.
    - c. Do not use liquid curing compound on surface against which additional concrete, other finishing materials, or coatings are to be bonded if their bond will be affected by curing compound.
    - d. Spraying shall be by power sprayer.
    - e. Immediately recoat, at the rate specified above, surfaces subjected to rainfall within 3 hours after compound has been applied or surfaces damaged by subsequent construction operations within the curing period.
  - 3. Curing Schedule:
    - a. Unformed surfaces shall receive an impervious sheet cure or curing compound as appropriate except as follows:
    - b. Use impervious sheet cure for exterior color textured finished surfaces.
    - c. Protect and cure finished concrete paving using curing compound.

### 3.12 CURING

- A. Curing Compound (Temporary Film Forming):
  - 1. Apply curing compound prior to saw cutting joints and as soon as concrete surface will not be damaged by curing operations.
  - 2. Clean slab surface and joints and remove loose or compacted saw debris prior to curing compound application.
  - 3. Apply compound at a rate of 700 to 1200 square feet per gallon with high volume, low pressure, atomized sprayer in accordance with manufacturer recommendations. Prevent over-application in excess of specified rate.
  - 4. Spread compound evenly using mopping pads. Mopping pads shall be Rubbermaid 24 inch Microfiber Wet Room Pad or equivalent.
  - 5. If whitening from over application occurs, consult manufacturer for removal of product with hot water and aggressive scrubbing.
  - 6. Do not allow compound to accumulate and puddle.
  - 7. Do not use polyethylene sheets or other impervious covers on exposed interior floors.

### 3.13 FORM REMOVAL

- A. Do not remove forms until concrete has hardened sufficiently to support its own weight and imposed construction loads.
  
- B. Remove forms in manner to avoid damage to concrete.
  
- C. Formwork for slabs and pavements, curbs and other parts not supporting vertical load of concrete may be removed as soon as concrete has hardened sufficiently to resist damage from removal operations, but in no case sooner than 12 hours.

- D. Remove wood forms from under floors, ramps, steps, and similar places (through temporary openings if necessary) so no material will be left to rot or to be infested by termites.

### 3.14 FINISHING PROCEDURE

#### A. Formed Surfaces:

1. Rough-Form Finish:
  - a. Patch tie holes and defects. Clip or rub off fins exceeding 1/2 inch in height. Leave surfaces with texture imparted by forms.
  - b. Apply on concrete surfaces not exposed to public view and where noted on Drawings.
2. Smooth-Form Finish:
  - a. Patch tie holes and defects. Remove fins exceeding 1/8 inch in height.
  - b. Apply on concrete surfaces exposed to public view and where noted on Drawings.

#### B. Initial Finishing:

1. Re-straighten surface irregularities with a 10 ft highway screed in two directions as close to perpendicular as possible before water appears on concrete surface.
2. Do no further working of surface until time for floating; do not work surface while water is present.
3. "Dry Sprinkle" method finishing is not acceptable and will be cause for rejection

#### C. Floating:

1. Begin float operations when bleed water sheen has disappeared and concrete has stiffened sufficiently to allow walking on surface without leaving heel prints more than 1/4 inch deep. Check and level the surface lane to an initial tolerance not exceeding 1/4 inch in ten feet when tested with a ten foot straight edge. Immediately after leveling, refloat surface to a uniform smooth granular surface. Use magnesium or aluminum power float unless otherwise specified.
2. Avoid premature finishing that brings excessive fines to surface causing finished slab to have soft surface which will dust.

#### D. Troweling:

1. Delay troweling as long as possible to prevent working excess fines and water to surface. Do not begin until surface moisture film and shine remaining after floating have disappeared. Trowel in alternate pass directions.
2. Power trowel using riding trowel where possible. Use hand trowel in inaccessible areas.
3. Do not over-trowel floors scheduled to receive curing/sealing compound unless specified otherwise.
4. Do not re-wet surface to trowel.
5. Final hand finish passes shall be done in the same direction. Finish all surfaces within a reasonable time period to provide uniformity of appearance.

#### E. Broom Finish:

1. Provide a floated finish, then finish with broom.
  - a. Heavy Broom Finish: Steel wire or stiff, coarse, fiber broom.
  - b. Light Broom Finish: Soft-bristled fiber broom.
2. Allow surface to harden sufficiently to retain scoring or ridges.
3. Broom transverse to traffic or at right angles to slope of slab.

- F. Sealing: Apply concrete sealer to interior concrete curbs in cart storage area and metal canopy column encasement.

#### G. Finish Schedule:

1. Unexposed Exterior Formed Surfaces: Rough form finish.
2. Exposed Exterior Formed Surfaces: Smooth form finish, stone rubbed.
3. Automotive Center Pit Floor and Slab above Pit: Troweled
4. Equipment Pads: Troweled
5. Dock : Light Broom.
6. Curbs: Troweled
7. Stair Treads: Heavy Broom.
8. Exposed exterior walking surfaces, truckwells, ramps, and outside slabs, unless otherwise noted on Drawings: Broom Finish.



3.15 JOINT FILLING AND SEALING

- A. Joint filling and sealing is specified in Section 07900.

3.16 DEFECTIVE CONCRETE

- A. Concrete that does not satisfy the performance requirements of this specification, including but not limited to, tolerance, strength, durability and finish shall be removed and replaced at no extra cost to the Owner if repair cannot be accomplished to the satisfaction of Wal-Mart Construction Manager.
- B. Patching;
  - 1. Notify Wal-Mart Construction Manager immediately upon discovery and before patching any imperfect areas.
  - 2. Repair and patch imperfect areas, with cement mortar, immediately after discovery. Imperfect areas not acceptable to Wal-Mart Construction Management will be considered defective.
  - 3. Cut out honeycomb, rock pockets, voids over ¼ inch in any dimension, surface imperfections and holes left by tie rods and bolts down to solid concrete, but in no case, to a depth of less than one inch. Make edges of cut perpendicular to the concrete surface. Thoroughly clean, dampen with water and brush-coat the area to be patched with specified bonding agent. Place patching mortar after bonding compound has dried.

3.17 FIELD QUALITY CONTROL

- A. Field quality control shall be the responsibility of the Contractor in accordance with Section 01452. Except as specified as mandatory, field quality control testing and inspection shall be at the discretion of the Contractor as necessary to assure compliance with Contract requirements. Owner T&I specified in Appendix B shall not preclude Contractor's responsibility to perform similar routine, necessary, and customary testing and inspection of the methods and frequency suitable for the type of work involved.
- B. Contractor shall collect and certify each delivery ticket of concrete. Verify that tickets indicate type of concrete delivered, amount of water added and time at which cement and aggregate were loaded into truck, and time at which concrete was discharged from truck.
- C. Responsibilities and Duties of Contractor Relative to Owner T&I:
  - 1. Notify CTL not less than 3 working days prior to placing concrete to allow time for site visit.
  - 2. Assist CTL in securing field specimens.
  - 3. Provide and maintain for sole use of CTL, facilities for safe storage and proper curing of concrete test cylinders at project site as required by ASTM C 31 and acceptable to CTL.

3.18 OWNER TESTING AND INSPECTION (T&I)

- A. The Owner will perform testing and inspection as specified in Appendix B (03310).

3.19 PROTECTION

- A. Protect finished work.
- B. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and damage.
- C. Patch or replace damaged portions of concrete.
- D. Protect wet cured or impervious sheet cured surfaces as follows:
  - 1. Barricade concrete surfaces immediately after finishing
  - 2. Do not allow light traffic, except for curing purposes, on concrete surfaces until concrete has attained 1800 psi (approx 3 days).
  - 3. Do not allow heavy traffic on concrete surface until concrete has attained, by test, its design strength as noted on drawings, but not sooner than 9 days after placement.

4. Permit concrete to dry minimum of 2 additional days after curing is completed before removing barricades.

E. Protect surfaces cured with curing compound as follows:

1. Barricade Concrete surfaces immediately after application of curing compound.
2. Do not allow traffic on concrete surfaces sooner than 3 days after placement.

### 3.20 CLEANING

A. Remove forms, equipment, protective coverings, and rubbish resulting from concreting operations. Leave finished concrete surfaces in clean conditions. Use vacuum with HEPA-rated filter to remove loose dirt and mud. Do not dry sweep. Remove mortar and concrete droppings. Wash concrete floors and platforms with soapy water and rinse with clean water.

B. Dispose of construction and universal waste in accordance with the requirements of the documents referenced in Section 01351.

END OF SECTION

# WAL-MART STORES

CONCRETE MIX DESIGN SUBMITTAL FORM  
(Section 03310 – Structural Concrete and Exterior Concrete Slabs)

Date \_\_\_\_\_

PROJECT TYPE: \_\_\_\_\_

## STORE INFORMATION

**STORE #** \_\_\_\_\_  
**ADDRESS** \_\_\_\_\_  
**CITY, STATE** \_\_\_\_\_  
**GENERAL CONTRACTOR** \_\_\_\_\_  
**COMPANY** \_\_\_\_\_  
**JOBSITE PHONE** \_\_\_\_\_

### A. CONCRETE INFORMATION

<b>Supplier Mix Design #</b>	_____
<b>Design Strength (f'c)</b>	_____ psi
<b>Water / Cementitious Ratio</b>	_____
<b>Total Air Content</b>	_____ %
<b>Total Est. Volume of Concrete</b>	_____ CY
<b>Concrete Uses/Locations</b>	_____
<hr/>	
<b>Mix Developed From:</b>	
<input type="checkbox"/>	Trial Mix Test Data ( <i>attach test data</i> )
<input type="checkbox"/>	Field Experience
<b>Density</b>	
Wet	_____ pcf      Dry _____ pcf
<b>Slump</b>	
_____ "	( ± 1" ) <b>WITHOUT</b> WR Admixture
_____ "	( ± 1" ) <b>WITH</b> WR Admixture



### B. ADMIXTURE INFORMATION

	ASTM Designation	Product (Manufacturer/Brand)	Dosage (ounces)	
			oz / cy	oz / cwt
<b>Water Reducing</b>				
<b>Accelerating</b>				
<b>Retarding</b>				

**C. MIX DESIGN**

**Mix Proportions (per cubic yard)**

	<b>Identification</b> (Type, size, source, etc.)	<b>Weight</b> (pounds)	<b>Density</b> (SSD)	<b>Volume</b> (cubic feet)	<b>% Aggregate Absorption</b>
Cement					
Fly Ash					
Slag					
Coarse Aggregate #1					
#2					
#3					
Fine Aggregate #1					
#2					
Water					
Air Content					
	<b>TOTALS</b>				

**Coarse & Fine Aggregate Gradation Information**

Sieve Size	% Passing Each Sieve (All Sieve Sizes must be entered)					Combined % Passing	Combined % Retained	
	Coarse Agg. # 1	Coarse Agg. # 2	Coarse Agg. # 3	Fine Agg. # 1	Fine Agg. # 2		Cumulative	Individual
1-1/2"								
1"								
3/4"								
1/2"								
3/8"								
# 4								
# 8								
# 16								
# 30								
# 50								
# 100								
# 200								
% of Vol								

**Aggregate Ratios**

<b>Coarseness Factor</b> =	$\frac{\text{Combined \% cumulative retained } 3/8'' \text{ sieve}}{\text{Combined \% cumulative retained } \#8 \text{ sieve}}$	=	
<b>Workability Factor</b> =	Combined % passing #8 sieve	=	
<b>Adj-Workability Factor</b> =	$WF + [(Cementitious \text{ Material} - 564) \div 37.6]$	=	
<b>Allowable Adj-WF</b> =	$Adj-WF = [(11.25 - .15 \text{ CF}) + 36] \pm 2.5$	=	<b>Low                      High</b>

**D. ATTACHMENTS:** Include the following with this Mix Design Report.

---

- Portland Cement mill test reports
- Fly ash mill test reports where required
- Slag mill test reports
- Designation, type, quality, and source (natural or manufactured) of coarse and fine aggregate materials
- Separate aggregate gradation reports including all required sieve sizes
  - All gradation sieve report tests dated within 60 days of this report
  - Report for each coarse and fine aggregate material in mix
- Statement if possible reactivity of aggregate, based on tests or past service
- Statement if possible aggregate pop-outs or their disruptions, based on tests or past service
- Product data for the following admixtures:
  - Chloride ion data and related calculations
  - Water reducing, set retarding, set accelerating, etc.
- Measured water-soluble chloride ion content in concrete (percent by weight of cement)
- Concrete compressive strength data used for standard deviation calculations

**E. CONCRETE SUPPLIER INFORMATION**

---

**Company Name** \_\_\_\_\_ **Tel. #** (\_\_\_\_) \_\_\_\_\_

**Address** \_\_\_\_\_

**City, ST Zip** \_\_\_\_\_

**Technical Contact** \_\_\_\_\_ **Cell #** (\_\_\_\_) \_\_\_\_\_

**e-mail** \_\_\_\_\_

**Sales Contact** \_\_\_\_\_ **Cell #** (\_\_\_\_) \_\_\_\_\_

**PRIMARY PLANT**

---

**SECONDARY PLANT**

---

**Plant Location:** \_\_\_\_\_

**Miles from Site:** \_\_\_\_\_

**Travel Time to Site:** \_\_\_\_\_

**NRMCA Certified:**  YES  NO

YES  NO

**State DOT Certified:**  YES  NO

YES  NO

**Batch Mixing Type:**  DRY  CENTRAL MIX

DRY  CENTRAL MIX

## SECTION 03314 - CAST-IN-PLACE CONCRETE SLABS (INTERIOR)

## PART 1 - GENERAL

## 1.1 SUMMARY

## A. Section Includes:

1. Replacement of cast-in-place concrete slabs including slabs on grade for the following:
  - a. Interior floor slabs.
  - b. Freezer floors.
2. Aggregate base below slab.
3. Reinforcement and accessories.
4. Curing and finishing.
5. Application of penetrating hardener/densifier to slabs not exposed to Customer view.

## B. Related Requirements: The following list is intended to aid in locating work related to or dependent on the scope of Work in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.

1. Section 01351 – Regulatory Compliance.
2. Section 01700 – Execution Requirements – Requirements for use of fuel powered equipment within the enclosed building.
3. Section 03310 - Structural Concrete and Exterior Concrete Slabs. All concrete not included in this section including structural concrete work and exterior slabs including, if applicable, exterior sidewalks, truckwells, door stoops, compactor pads, compressor house equipment pads, drive-thru Pharmacy pavement, Garden Center exterior slabs, Auto Center pit floors, slab over Auto Center pit, and Auto Center equipment pads
4. Section 05120 - Structural Steel: Column anchor bolts.
5. Section 05500 - Metal Fabrications: Metal components cast into concrete.
6. Section 07210 – Building Insulation: Foundation Perimeter Insulation.
7. Section 07900 - Joint Sealers: Joint fillers and sealants for floor slabs.
8. Section 09650 - Resilient Flooring: Joint filler for contraction and construction joints concealed by floor finish material.
9. Appendix B – Testing, Inspection and Observation by Owner: Procedures for inspection, testing, and documentation by Owner furnished testing laboratory.

## 1.2 REFERENCES

## A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.

## B. American Association of State Highway and Transportation Officials (AASHTO):

1. Standard Specification For Transportation Materials And Methods Of Sampling and Testing:
  - a. AASHTO T318 - Water Content of Freshly Mixed Concrete Using Microwave Oven Drying (Formerly AASHTO TP 23)
  - b. AASHTO M147 – Materials for Aggregate and Soil-Aggregate Subbase, Base, and Surface Courses

## C. American Concrete Institute (ACI):

1. ACI 117 - Standard Tolerances for Concrete Construction and Materials.
2. ACI 301 - Structural Concrete.
3. ACI 305.1 - Hot Weather Concreting.
4. ACI 306.1 - Cold Weather Concreting.
5. ACI 308.1 - Standard Specification for Curing Concrete.
6. ACI 347 - Guide to Formwork for Concrete
7. ACI SP66 - ACI Detailing Manual

## D. ASTM International (ASTM):

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1. ASTM A36 – Carbon Structural Steel.
2. ASTM A82 - Steel Wire, Plain, for Concrete Reinforcement.
3. ASTM A185 - Steel Welded Wire Fabric, Plain, for Carbon Steel, 60,000 PSI Tensile Strength Concrete Reinforcement.
4. ASTM A615 - Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
5. ASTM A706 - Standard Specification for Low-Alloy Steel deformed and Plain Bars for Concrete Reinforcement
6. ASTM C31 - Making and Curing Concrete Test Specimens in the Field.
7. ASTM C33 - Concrete Aggregates.
8. ASTM C94 - Ready-Mixed Concrete.
9. ASTM C136 - Sieve Analysis of Fine and Coarse Aggregates
10. ASTM C150 - Portland cement.
11. ASTM C309 - Liquid Membrane-Forming Compounds for Curing Concrete.
12. ASTM C403 - Time of Setting of Concrete Mixtures by Penetration Resistance.
13. ASTM C494 - Chemical Admixtures for Concrete.
14. ASTM C702 - Reducing Field Samples of Aggregate to Testing Size.
15. ASTM C881 - Epoxy-Resin-Base Bonding Systems for Concrete
16. ASTM C 1107 - Packaged Dry, Hydraulic-Cement Grout (Non-Shrink).
17. ASTM C1218 - Water-Soluble Chloride in Mortar and Concrete.
18. ASTM C 1602 - Mixing Water used in the Production of Hydraulic Cement Concrete.
19. ASTM D75 - Sampling Aggregates
20. ASTM D 98 - Calcium Chloride.
21. ASTM D448 - Classification for Sizes of Aggregate for Road and Bridge Construction
22. ASTM D698 - Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 5.5 lb (2.49 Kg) Hammer and 12-in (305 mm) Drop.
23. ASTM D1241 – Standard Specification for Materials for Soil-Aggregate Subbase, Base and Surface Courses
24. ASTM E96 - Water Vapor Transmission of Materials
25. ASTM E154 - Water Vapor Retarders Used in Contact with Earth under Concrete Slabs, on Walls or as Ground Cover.
26. ASTM E1155 - Determining Floor Flatness and Levelness Using the F-Number System (Inch-Pound Units).
27. ASTM E1745 - Plastic Water Vapor Retarders Used in Contact with Soil Or Granular Fill Under Concrete Slabs

E. American Welding Society (AWS):

1. AWS D1.4 - Structural Welding Code Reinforcing Steel.

F. Concrete Reinforcing Steel Institute (CRSI):

1. CRSI Manual of Standard Practice.
2. CRSI Placing Reinforcing Bars.

G. Department of Commerce (National Institute of Standards and Technology) – Product Standard (DOC):

1. DOC PS 1 - Construction and Industrial Plywood.

H. National Ready-Mix Concrete Association:

1. NRMCA Inspection Standards

I. U.S. Army Corps of Engineers (COE):

1. COE CRD-C 401 – Staining Properties of Water.

J. Occupational Safety and Health Administration (OSHA):

1. OSHA 01926.1153 Respirable Crystalline Silica.

### 1.3 ENVIRONMENTAL REQUIREMENTS

- A. Minimize dust emissions and provide equipment that suppresses dust.

### 1.4 SUBMITTALS

03314-2

- A. Submittal Procedures: Unless otherwise specified herein, submit in accordance with procedures specified in Section 01330.
1. Submit all submittal items required within this section in a single submittal. Do not submit submittals of this section together with submittals in section 03310 or any other section. Identify submittals explicitly in accordance with Procedures paragraphs in Section 01330.
- B. Submit to designated parties and within the periods specified in the Concrete Submittal Register included at the end of this section.
- C. Concrete Contractor's Certification (For placements larger than 10,000 square feet):
1. Submit Contractor's Qualification Statement of Conformance included at the end of this section.
  2. Provide ACI floor finisher certification documents for at least three finishers who will be installing slab placements.
- D. Concrete Supplier Approval (For placements larger than 10,000 square feet): Submit Statement of Acceptance of Concrete Supplier as described in Quality Assurance paragraph below.
- E. Concrete Batch Plant Certifications (For placements larger than 10,000 square feet): Name and address of the concrete supplier's batch plant and plant certifications by National Ready-Mix Concrete Association and/or State Department of Transportation.
- F. Sieve Analysis for Aggregate Base: Submit current sieve analysis report, sampled and tested within the last 60 days of submittal date, for aggregate base and choker material.
- G. Concrete Mix Design: Fill out and submit attached Concrete Mix Design Submittal Form for interior slabs. Submit only one form indicating same mix design proportions for all interior slabs concrete.
1. Fill out completely all information indicated on the form.
  2. Submit only one mixture design form indicating same mix design for all interior slabs.
- H. Attachments to Concrete Mix Design: Submit the following as attachments to be included with the Concrete Mix Design:
1. Cement materials mill test reports for the following:
    - a. Portland cement
  2. Designation, type, quality, and source (natural or manufactured) of coarse and fine aggregate materials.
  3. Sieve Analysis Reports: Provide separate sieve analysis of percentages passing for coarse and fine aggregate. Show values for each sieve size shown on the mix design form. Do not leave any line blank. Sieve analysis sampling and testing for each aggregate source shall be conducted within 60 days of concrete submittal date.
  4. Aggregate Supplier Statement:
    - a. Stating if aggregate is possibly alkali-reactive, based on tests or past service
    - b. Stating if aggregate can possibly cause pop-outs, "D" cracking, or other disruptions due to moisture gain, freezing, or other mechanisms, based on tests or past service.
  5. Product data for the following concrete materials admixtures:
    - a. Liquid color
    - b. Water reducing
    - c. Set retarding
    - d. Set accelerating
    - e. Data indicating chloride ion content information for each admixture
  6. Concrete compressive strength data as required by ACI 301.
  7. Concrete Supplier Approval (For placements larger than 10,000 square feet).
  8. Chloride-Ion Content (For reinforced slabs only): Measured water-soluble chloride-ion content (percent by weight of cement materials) in accordance with ASTM C 1218.
- I. Slab Reinforcing Bar Shop Drawings:
1. Complete information for installing reinforcing, including placement plans, bar bending diagrams, splice lengths and locations, bar spacing, concrete cover, support devices and accessories.
  2. Conform to ACI SP 66.
  3. Perimeter foundation tie reinforcing submittals as specified in Section 03310.



- J. Product Data: Brand name, chemical composition, installation directions and certificates of compliance with required standards for the following products:
1. Doweling system for construction joints
  2. Doweling system for sawed contraction joints (if required)
  3. Temporary film forming curing compound
  4. Vapor retarder (If required) and tape
- K. Slab Joint and Placement Plan:
1. Provide a pour plan identifying the following:
    - a. Exterior walls and column grid locations.
    - b. Extent of pours including width, length, slab placement area and volume.
    - c. Locations of construction joints.
    - d. Location of sawn contraction joints if different from those shown or if not shown on the drawings.
  2. Slab joint and placement plan shall be developed and submitted on a full-sized copy of the Architectural Floor Plan.
- L. Pre-Slab Installation Meeting (For placements larger than 10,000 square feet.):
1. Provide record of notification of pre-slab meeting including company name, persons contacted, and date and method of contact.
  2. Provide meeting minutes to all participants and Wal-Mart Construction Manager including sign-in sheet.
- M. Delivery Tickets:
1. Copies of delivery tickets for each load of concrete delivered to site.
  2. Indicate on each ticket information required by ASTM C94 including additional information required for slabs.
  3. Information on ticket shall include quantities of all material batched including the amount of free water in the aggregate and the quantity of water that can be added at the site without exceeding the maximum water cement ratio of the approved mix design. Aggregate moisture corrections shall be based on ASTM definitions of aggregate moisture content and absorption.
  4. Mix identification number on ticket shall match number on submitted and approved mix design.

## 1.5 QUALITY ASSURANCE

- A. Truck inspection (For placements larger than 10,000 square feet): Inspect ready-mix concrete trucks proposed for slabs and pavements.
1. Conform to ASTM C94, NCRMA and Department of Transportation standards in state where project is located.
  2. Perform inspections immediately before starting concreting operations.
  3. Record acceptable truck numbers.
  4. Record the identification numbers of those trucks found to be acceptable on the basis of inspections.
  5. Do not bring on site for concreting operations, any truck whose numbers are not recorded as acceptable. Notify Wal-Mart Testing Lab if non-conforming trucks are used to deliver concrete for slabs and pavements.
- B. Tolerances:
1. Conform to most stringent requirements of ACI 117 and ACI 301 except as specified herein.
  2. Finished Surface Flatness and Levelness (For placements larger than 10,000 square feet.):
    - a. The minimum local area shall be bound on each side by column lines.
    - b. Sales Floor Interior Floor Slabs: Specified Overall Value (SOV) FF 40 / FL 30 and Minimum Local Value (MLV) FF 28 / FL 20 tolerance for troweled floors in accordance with ACI 117.
    - c. Non-Sales Floor Interior Floor Slabs: Specified Overall Value (SOV) FF 35 / FL 25 and Minimum Local Value (MLV) FF 24 / FL 17 tolerance for troweled floors in accordance with ACI 117.
    - d. Remedies for Out-of-Tolerance Work:
      - 1) Remove and replace slabs-on-grade measuring below either (or both) of specified minimum local F-numbers.
      - 2) At option of Owner, Contractor may be allowed to submit alternatives for remediation.
    - e. Costs for corrective work, remedies for out-of-tolerance work, and extra testing as required by defective work shall be borne by Contractor.

- f. Validate existing elevations where new slab will abut existing. The Contractor must notify the EOR in writing within 48 hours of new concrete installations if the existing elevations will prevent achieving specified surface profile tolerances.
  - 3. Slab on grade dowels:
    - a. Install dowels within plus or minus (+/-) 1/8" in dowel alignment in vertical and horizontal planes.
    - b. Install dowels horizontally on the bulkhead at the greater depth of either mid-slab or 2-1/4 inch from slab surface to center line of the plate.
- C. Penetrating Hardener/Densifier Installer Qualifications:
  - 1. Minimum of 15 concrete finish applications within last 3 years similar in type and size to Work of this Contract.
  - 2. Provide letter of certification from the penetrating hardener/densifier manufacturer stating that installer is a certified applicator of the specified concrete finish material and is familiar with proper procedures and installation requirements required by manufacturer.
- D. Concrete Supplier Approval (For placements larger than 10,000 square feet.):
  - 1. The concrete supplier shall be fully approved and acceptable by the concrete subcontractor as the producer of concrete for which the subcontractor is to place and finish. Prepare Statement of Approval of Concrete Supplier stating project name, name of concrete supplier, along with the statement of approval and the signatures of the Contractor and concrete floor subcontractor. Submit statement as specified in Submittals paragraph above.
- E. Floor Finisher Qualifications (For placements larger than 10,000 square feet.):
  - 1. The concrete floor finishing subcontractor Lead Finisher and at least two additional members of the finishing crew shall be certified under the Concrete Flatwork Finisher Training and Certification Program as granted by the American Concrete Institute and shall be present during finishing of the sales floor concrete.
  - 2. The concrete floor finisher subcontractor shall have experience in finishing interior floors of similar size and scope in at least 5 previous projects.
- F. Workmanship:
  - 1. Remove and replace or repair concrete related Work which does not conform to specified requirements including strength, tolerances and finishes as directed by Owner.
  - 2. Bear cost of corrections or delays to other work affected by, or resulting from, corrections to concrete Work.
  - 3. If results of compressive strength tests reveal deficiencies in concrete, meet requirements of ACI 301.
- G. Concrete Plant Certification (For placements larger than 10,000 square feet.): Certify primary and secondary plants proposed for furnishing concrete as being approved at highest level by NRCMA and by Department of Transportation in State where project is located.
- H. Pre-Slab Installation Meeting (For placements larger than 10,000 square feet.):
  - 1. Plan, host, and attend a pre-slab installation meeting to be conducted at site by SSI via teleconference.
  - 2. Schedule meeting approximately 7 days prior to first concrete slab removal and after all concrete submittals have been submitted and approved.
  - 3. Obtain pre-slab meeting agenda from Wal-Mart Consultant (Structural Services, Inc. (SSI)
  - 4. Require responsible representatives of each party involved with the concrete slab work to attend the meeting. Representatives to be present shall include personnel who are directly involved in overseeing the work and who have authority to control the concreting work.
  - 5. Notify all required attendees in writing of scheduled time and place at least two weeks in advance of meeting. Include copy of agenda with invitation.
  - 6. The meeting shall convene only when all parties are present.
  - 7. Minutes of the meeting shall be recorded, typed, printed, and distributed to all parties concerned by the Contractor within 5 days of the meeting. One copy of the minutes shall also be transmitted to the Owner's representative for information purposes.
  - 8. Attendees shall include, but not be limited to the following:
    - a. Wal-Mart Construction Manager
    - b. Wal-Mart Consultant (SSI, [wmr@ssiteam.com](mailto:wmr@ssiteam.com))
    - c. Architect of Record

- d. Structural Engineer of Record
  - e. General Contractor
    - 1) Project manager
    - 2) Superintendent (present during all slab placements)
  - f. Concrete Subcontractor
    - 1) Project manager
    - 2) Finish Foreman (present during all slab placements)
  - g. Concrete Supplier
    - 1) Quality Assurance Representative (present during all slab placements)
  - h. Wal-Mart Construction Testing Laboratory (present during all slab placements)
9. Changes to the contract documents from recommendations or discussions at the Pre-Construction meeting shall be approved in writing by the Wal-mart Construction Manager prior to implementation. SSI is not authorized to change any specified requirement or to approve execution of any portion of the work.

- I. Notification to Testing Lab for Observation of Installed Formwork and Reinforcement: Notify Testing Lab 3 working days prior to placing concrete to allow time for observation of installed formwork and reinforcing.

#### 1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in unopened containers with labels identifying contents. Keep containers closed and upright to prevent leakage.
- B. Mark reinforcing, accessories and embedded items for proper identification and placement location.
- C. Store materials, except aggregate, off ground in dry area and in manner to prevent damage. Protect liquid materials from freezing.
- D. Stockpile aggregate in manner to prevent contamination with other materials or with other sizes of aggregates. Conduct tests for determining conformance to requirements at point of batching. Do not use bottom 6" of aggregate piles in contact with ground. Allow sand to drain until it has reached uniform moisture content before it is used.
- E. Store admixtures in manner to prevent contamination. Protect admixtures from extreme temperatures which would adversely affect their characteristics.
- F. Dispense penetrating hardener/densifier finish material from factory numbered and sealed drums. Maintain record of drum numbers.

#### 1.7 PROJECT CONDITIONS

- A. Air Quality:
  - 1. Provide adequate ventilation to work area at all times.
  - 2. Do not operate combustible fuel equipment, with the exception of propane powered equipment found in this specification, within building perimeter walls.
  - 3. Do not use unvented combustion heaters during concrete placement so as to prevent exposure of concrete to excessive exhaust gases containing carbon dioxide (CO<sub>2</sub>) or carbon monoxide (CO). During slab placement and curing periods, maximum CO<sub>2</sub> levels shall be 4,500 parts per million and maximum CO levels shall be 15 parts per million at concrete surface within 5 feet of any source of exhaust gases to minimize potential damage to concrete.

#### 1.8 COORDINATION AND SCHEDULING

- A. Pursuant to Article 2.7 of the Construction Contract Between Walmart and Contractor, the Owner has the right to perform construction work and to award separate contracts on the Project site.
- B. The construction work and separate contracts on the Project site associated with the floor slab construction may include LP cabling, CCTV cabling, Test and Balance, Telecom, Data cabling, and Alarms.

- C. Owner Or Separate Contractor Responsibilities: The following provisions are provided as information with respect to the responsibilities of the Owner or Separate Contractors doing work on, or related to, the building floor slab construction. The Owner or separate contractors must:
1. Notify General Contractor's superintendent 1 week prior to the start of the work at the job site. Make sure superintendent has names and contact phone numbers.
  2. Coordinate work and schedule activities with floor slab construction to avoid interference and to minimize detrimental effects to floor finish.
  3. Not walk through or on areas where floor construction or finishing operations are being performed.
  4. Perform precautionary measures to protect floor finish. Inspect machinery used on floor slab daily, at a minimum, for embedded items in tires; remove items which may damage or scratch floor. Diaper all lifts and other equipment used on the floor slab. White tires are required on lifts. Take measures to prevent tools or other items that may cause impact damage, discoloration, or other surface blemishes. Owner or Separate Contractors are required to provide protection to slab in whatever measures are needed i.e. providing plywood, carpet, house wrap etc for impact protection. (Plastic sheets are not approved for protection) Remove or consolidate protection on a regular basis to prevent discoloring.
  5. Damage to concrete floor finish determined by Wal-Mart to be the responsibility of the Owner or Separate Contractor will be repaired in accordance with approved methods, materials, and personnel at the expense of the Owner or Separate Contractor.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Subject to compliance with project requirements, provide products as manufactured by the following to the extent as specified hereinafter for the specific product:
1. American Decorative Concrete (800) 592-9320 [www.adcsc.com](http://www.adcsc.com)
  2. Ardex Engineered Cements, (312) 218-6893.
  3. BASF Admixtures Inc., Cleveland, OH (Formerly Master Builders) (800) 628-9990.
  4. BASF Building Systems, Shakopee, MN (Formerly Degussa Building Products) (800) 433-9517.
  5. BW Manufacturing, Inc., (616) 447-9076.
  6. Colloid Environmental Technologies Co. (CETCO), (800) 527-9948
  7. Commercial Metals Company (214) 689-4300.
  8. Convergent Concrete Technologies, Orem, UT (866) 375-2280 [www.convergentconcrete.com/](http://www.convergentconcrete.com/)
  9. Curecrete Distribution, Incorporated, (800) 998-5664.
  10. Davis Colors, (800) 800-6856.
  11. Dayton Superior Chemical, (866) 329-8724.
  12. DBB (Dowel Bars and Baskets) Co. (816) 994-9090.
  13. Dustless Technologies (800) 568-3949.
  14. E-Poxy Industries, Inc., (800) 833-3400.
  15. Euclid Chemical Co., (877) 438-3826.
  16. Fortifiber Building Systems Group, (800) 773-4777.
  17. Henry Company (Synko-Flex Products Division); (800) 231-4551.
  18. Husqvarna (800) 288-5040.
  19. L. M. Schofield Co., (800) 800-9900.
  20. L & M Construction Chemicals Inc., (800) 362-3331
  21. PNA Construction Technologies, (800) 542-0214.
  22. Prosoco, Lawrence, KS, (866) 363-4567 [www.prosoco.com](http://www.prosoco.com)
  23. Raven Industries, Inc., (800) 635-3456.
  24. Seal Source (800) 305-9144. [www.sealsource.com](http://www.sealsource.com)
  25. Sika Corp., (Sika and Greenstreak products) (800) 933-7452.
  26. Solomon Colors, (800) 624-0261.
  27. SpecChem (866) 791-8700. [www.specchemllc.com](http://www.specchemllc.com)
  28. Stego Industries (877) 464-7834.
  29. W.R. Grace and Co., (713) 223-8353.
  30. W. R. Meadows, Inc. (847) 214-2100.
  31. Vexcon Chemicals, Inc., (888) 839-2661.

- B. Substitutions: Not permitted unless otherwise specified.

## 2.2 AGGREGATE BASE AND CHOKER MATERIALS

### A. Aggregate Base Material:

1. Upon removal of the existing concrete slab, the existing base material shall be inspected. Only remove and replace existing material if it does not conform to the following requirements.
2. Gradations shall be one of the following.

a. Any state DOT approved road base material meeting the following gradation:

Standard Sieve Size	Percent Passing
1-1/2"	100
No. 4	15-55
No. 200	3-12

- b. Material conforming to the General Requirements and of the Gradation "A", "C", or "D" requirements (with the modified allowance of 5% to 12% passing the No. 200 sieve) as defined by ASTM D 1241.
3. Material passing the No. 200 sieve shall be clean granular fill with less than 3% clay and/or friable particles.

### B. Aggregate Choker Material: Clean granular fill with less than 3% clay and/or friable particles. Use one of the following gradations:

1. ASTM 448 No. 10 with 6% to 12% passing No. 200 sieve.
2. Material meeting the following gradation:

Standard Sieve Size	Percent Passing
No. 4	85-100
No. 8	75-95
No. 16	55-75
No. 50	22-45
No. 100	10-30
No. 200	6-12

## 2.3 FORMWORK:

### A. Forms:

1. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on the drawings.
2. Provide lumber dressed on at least two edges and one side for tight fit.
3. Bevel top outside edge of form.
4. Partial depth forms shall not be used.

### B. Form Release Agents:

1. 100% biodegradable, non-toxic, 100% natural organic chemical release agent that will not cause surface imperfections and is non-staining and compatible with field applied paints, toppings, curing compounds and other coatings. Provide one of the following:
  - a. Form-EZE Natural by Euclid Chemical, (800) 321-7628.
  - b. Certi-Vex V Form Release by Vexcon, (888) 839-2661.
2. Use same brand form release agent for all forms.

### C. Prefabricated Access Pit Form: Pit form at Refrigeration Pit:

1. Prefabricated Composite Access Pit and Anchoring Assembly as manufactured by Craigg Manufacturing, LLC., Sinking Spring, PA, (610) 678-8200, [craiggmfg@craigg.com](mailto:craiggmfg@craigg.com).
  - a. Model: POL – Pourover, by Craigg.

## 2.4 REINFORCEMENT

### A. Reinforcing Bars:

1. ASTM A615, deformed, Grade 60.
2. ASTM A706, deformed, Grade 60.

- B. Tie Wire:
  - 1. Minimum 16 gage annealed type.
  
- C. Reinforcing Support Devices:
  - 1. Manufactured support devices of metal (wire bar), concrete, or recycled plastic devices conforming to CRSI Manual of Standard Practice.
  - 2. Do not use wood, brick and other devices that can expand due to moisture gain.
  - 3. Precast concrete bar supports shall have minimum compressive strength of 3500 psi.
  - 4. Plastic accessories shall have a minimum of 50% recycled content.
  - 5. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.
  - 6. When precast concrete bar supports are used over aggregate base, or over waterproof membranes and vapor retarders, properly embed tie wires to prevent penetration of substrate.
  - 7. Properly size foot of bar supports or similar devices to prevent settlement on base material or prevent puncture on vapor barrier.
  - 8. When supporting multiple layers of reinforcement, provide the proper size and spacing of bar supports or similar devices to prevent deformation of plastic and to retain rebar within position tolerances.
  
- D. Formed Construction Joints - use one of the following:
  - 1. Plate Dowels
    - a. Provide plate dowels consisting of smooth steel plate bars, ASTM A36 steel. Provide one of the following:
      - 1) Diamond Dowel System, by PNA Construction Technologies, size 1/4 inch x 4-1/2 inch dowels.
      - 2) Speed Plate System by Greenstreak, size 1/4 inch x 4 inch x 6 inch dowels.
  - 2. Smooth Round Dowels
    - a. ASTM A615, grade 60, plain steel bars cut true to length with ends square and free from burrs.
      - 1) 1/2 inch diameter x 18 inches long.
  
- E. Dowel Bars: ASTM A615, grade 60, plain steel bars cut true to length with ends square and free of burrs.

## 2.5 CONCRETE MATERIALS

- A. Cement: ASTM C150, Type I or II. Use only one brand throughout project.
  
- B. Aggregates:
  - 1. ASTM C33 with following requirements:
    - a. No coal or lignite in concrete that will not be covered by building materials or soil.
    - b. Fine aggregate grading requirements as defined in section 6.1 of ASTM C 33 shall be strictly met without deviation unless approved by the Structural Engineer.
  - 2. If manufactured sand is used, blend with 25% natural sand unless otherwise approved by Structural Engineer.
  - 3. Coarse Aggregate Size:
    - a. Nominal maximum coarse aggregate size shall be 3/4 inch for slabs less than 5 inches thick. Nominal maximum coarse aggregate size shall be 1 inch for slabs greater than 5 inches thick.
    - b. The nominal maximum size of an aggregate is the smallest sieve size through which the major portion of the aggregate must pass, with a minimal amount retained on the maximum sieve size. Maximum 4% shall be retained on the nominal maximum size sieve.
  - 4. Adjust proportions of coarse, intermediate, and fine aggregates to provide the following material proportioning characteristics unless otherwise approved:
    - a. Coarseness Factor of 60 to 75%.
      - 1) The Coarseness Factor (CF) is the percent of combined aggregate retained on the #8 sieve that is also retained on the 3/8" sieve.
      - 2) The Coarseness Factor is calculated as follows:  $CF = \frac{\text{Aggregate retained on } 3/8'' \text{ sieve}}{\text{Aggregate retained on } \#8 \text{ sieve}}$
    - b. Adjusted Workability Factor
      - 1) The Workability Factor (WF) is the percent of combined aggregate that passes the #8 sieve.
      - 2) The Adjusted Workability Factor (Adj-WF) is calculated as follows:

- a)  $\text{Adj-WF} = \text{WF} + [(\text{Cement Material} - 564 \text{ lbs}) / 37.6]$
  - 3) The range of accepted Adj-WF for a given CF is as follows:
    - a)  $\text{Adj-WF} = [(11.25 - .15 \text{ CF}) + 36] \pm 2.5$ .
- 5. Gradation requirement of ASTM C33 may be waived in order to meet ranges specified.
- C. Water: ASTM C 1602 Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete.

## 2.6 CHEMICAL ADMIXTURES

- A. Provide admixture products meeting the specified ASTM standards upon submittal of product data and approval by the engineer.
- B. Water Reducing Admixture: ASTM C494, Type A.
- C. Water Reducing Admixture: ASTM C494, Type F.
  - 1. For trowel finished slabs, do not use Type F water reducing admixture, or all range water reducing admixture at Type F dosage rate.
- D. Water Reducing and Retarding Admixture: ASTM C494, Type B or D.
- E. Accelerating Admixture: ASTM C494, Type C or E.
- F. Integral Color (Liquid Coloring Agent): Provide one of the following colors. Provide liquid color at a dosage of 17 lbs per yard of concrete.
  - 1. Chromix L: C-26 "Antique Cork", by L.M. Scofield.
  - 2. Color Flo Liquid Color: 757 "Pecan", by Solomon Colors.
- G. Integral Color (Liquid Coloring Agent): Provide one of the following specified colors. Provide liquid colors with dry loading at 1.5 percent of the total cementitious material used.
  - 1. [Color Flo Liquid Color](#): Fawn Pebble by Solomon Colors.

## 2.7 RELATED MATERIALS

- A. Evaporation Retardent: Water-based polymer, sprayable.
  - 1. Euco-Bar, by Euclid
  - 2. Confilm, by Master Builders.
  - 3. Aquafilm, by Dayton Superior.
- B. Screed Chairs: Metal.
- C. Vapor Retarder: ASTM E1745, Class A or B, sheet membrane material, not less than 10 mils thick.
  - 1. Moistop Ultra 10, by Fortifiber, (800)-773-4777.
  - 2. Perminator 10 mil, by W.R. Meadows, (847) 214-2100.
  - 3. Griffolyn 10 mil Green, by Reef Industries, (713) 507-4200.
  - 4. Vapor Block 10 mil, by Raven Industries, (800) 635-3456.
  - 5. Tape and Adhesive: Tape and adhesives for sealing laps, punctures, tears and penetrations shall be pressure-sensitive, waterproof adhesive tape, 2 inches minimum width and compatible with retarder.
- D. Foundation Perimeter Insulation: Specified in Section 07210.
- E. Epoxy Bonding Agent: ASTM C881
  - 1. Euco #452 or Corr-Bond, by Euclid.
  - 2. EVA-POX Fresh Concrete Bonder 2, by E-Poxy Industries.
  - 3. Concessive Liquid (LPL), by MBT Building and Repair (Degussa).
  - 4. Sikadur 32, Hi-Mod LPL by Sika.

- F. Pre-Densifier Floor Cleaner: As recommended by densifier manufacturer.
- G. Densifier: Concrete lithium based chemical densifier specifically for concrete surface treatment which reacts chemically to the concrete surface forming a clear, dense, durable, hard, abrasion-resistant surface. Product shall be a colorless, odorless, water-based solution that is less than 50 VOC.
  - 1. SureLock, by American Decorative Concrete.
  - 2. Pentra-Sil (NL) by Convergent.
  - 3. Ashford Formula by Curecrete.
  - 4. Consolideck LS by Prosoco.
  - 5. MasterKure HD 300WB, by BASF (if approved for carbonated or dusting slab).
- H. Non-shrink Grout: Pre-mixed non-shrinking, high strength grout, ASTM C1107, Type A, B, or C; compressive strength of 5000 psi in 28 days.
  - 1. NS Grout, by Euclid.
  - 2. Construction Grout, by Master Builders.
  - 3. SonogROUT, by Sonneborn.
  - 4. Certi-Vex Grout #1000, by Vexcon.
  - 5. Enduro 50, by Conspec.

## 2.8 CONCRETE CURING MATERIALS

- A. Temporary Film Forming Curing Compound:
  - 1. SC Cure 500 by SpecChem.
  - 2. PCA Curing Agent by American Decorative Concrete.

## 2.9 CONCRETE MIX

- A. General:
  - 1. Use only materials and their proportions included on Concrete Mix Design Submittal Forms included at the end of this section.
  - 2. For integral color concrete, maintain same source of chemical admixtures, coarse and fine aggregates for entire colored floor slab. Do not change mix proportions of integral color admixture or Portland cement.
  - 3. Measure and mix ingredients in accordance with most stringent requirements of ASTM C94.
  - 4. Ready Mix supplier may proportion materials by field experience or proportion concrete materials by laboratory trial batches per ACI 301 for strength compliance.
  - 5. Submit copies of data and test results to Wal-Mart Construction Manager and Structural Engineer for review to verify mix designs.
- B. Strength: Minimum compressive strength (F'c) at the end of 28 days shall be 4,000 psi for all cast-in-place interior concrete slabs, unless indicated otherwise on the drawings.
- C. Workability: Concrete shall be of a consistency to be worked readily into forms and around reinforcement without segregation, voids, or excessive bleeding.
- D. Minimum Cement Content:
  - 1. 560 lbs/cy for materials used in placements less than 5,000 square feet.
  - 2. 520 lbs/cy for materials used in placements 5,000 square feet and larger.
- E. Supplementary Cementitious Materials:
  - 1. For troweled interior slabs, do not use fly ash, slag, or other supplementary cementitious materials.
- F. Water/Cement Materials Ratio:
  - 1. Interior Floor Slabs: 0.53 maximum
- G. Air-Entraining Admixture: Do not air-entrain interior floor slabs with troweled finish.



- H. Slump at the point of placement shall not exceed 6 inches. Maximum slump variance shall be  $\pm 1$  inch.
- I. Admixtures:
  - 1. Water-reducing admixture may be added to improve workability for desired minimal water content.
  - 2. Use admixtures in accordance with manufacturer's recommendation.
- J. Calcium Chloride Admixture:
  - 1. Calcium chloride (Type L) conforming to ASTM D 98 may be used in solution form as part of the mixing water to accelerate concrete setting and early-strength development.
  - 2. Amount of calcium chloride added shall not be more than necessary to produce the desired results and shall not exceed 1% by weight of cement.
  - 3. Calcium chloride shall not be used in the following applications unless approved by Structural Engineer:
    - a. concrete containing embedded dissimilar metals or aluminum
    - b. slabs supported on permanent galvanized steel forms
    - c. concrete exposed to deicing chemicals
    - d. prestressed or post-tensioned concrete
    - e. concrete containing aggregates with potentially deleterious reactivity
    - f. concrete exposed to soil or water containing sulfates.
  - 4. Use calcium chloride in accordance with manufacturer's recommendation.
  - 5. Chloride-ion Concentration: Maximum water-soluble chloride-ion concentrations in hardened concrete at ages from 28 to 42 days contributed from the ingredients including water, aggregates, cement materials, and admixtures shall not exceed the following limits unless approved by the Structural Engineer:

Type of Member	Maximum water-soluble chloride ion (Cl-) content in concrete (percent by weight of cement)
Prestressed concrete	0.06
Reinforced concrete exposed to chloride in service	0.15
Reinforced concrete that will be dry or protected from moisture in service	1.00
Other reinforced concrete construction	0.30

- 6. When using calcium chloride or other admixtures containing chlorides, measure water-soluble chloride-ion content (percent by weight of cement materials) per ASTM C 1218. Sample shall be from concrete representing the submitted mix design and maximum chloride dosage anticipated for the project.

2.10 MIXING

- A. Ready-Mixed Concrete: Mix and transport in accordance with ASTM C94 and ACI 301 except as specified.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Conform to manufacturer's printed instructions for materials and equipment.

3.2 PREPARATION

- A. Preplacement Inspection (For placements larger than 10,000 square feet only): All trades and participants involved shall verify that preparations are in conformance with Contract documents. Use approved sign-off forms.
- B. Testing Laboratory Notification (For placements larger than 10,000 square feet only): Notify Wal-Mart Testing Laboratory a minimum 24 hours prior to commencement of concreting operations.
- C. Cleaning Equipment: Remove hardened concrete and foreign materials from mixing and conveying equipment.
- D. Ensure that all work is properly coordinated:
  - 1. Structural Drawings and Specifications with those of other disciplines.

2. Use final corrected Shop Drawings, placing Drawings and material / equipment Drawings
- E. Verify anchors, seats, plates, reinforcement, and other items to be cast into concrete are accurately placed, held securely, and will not cause difficulty in placing concrete.
- F. Roof construction, RTUs, skylight installation, overhead painting, and roof drainage system shall be complete and weather tight prior to placement of slabs.

### 3.3 AGGREGATE BASE PLACEMENT

- A. Unless otherwise specified on the Drawings, place aggregate base as specified herein.
- B. Aggregate Base:
  1. Install coarse aggregate base as necessary to maintain original design slab thickness.
  2. Compact to final thickness shown in layers not exceeding 6 inches with minimum of 2 passes per layer with vibratory compactor.
- C. Aggregate Base Fine Grading:
  1. Compact to final thickness noted with 2 passes minimum vibratory compactor to produce smooth, flat, dense surface.
  2. Do not allow excess moisture or soft soil beneath vapor retarder at time of placing concrete.
  3. Level off coarse aggregate top surface with aggregate choker material as necessary as follows:
    - a. To reduce surface friction and to meet specified fine grade tolerances specified below. Typically required up to 3/4" thick in areas exposed to rain, traffic, or excavation for pits and buried utilities.
    - b. Where aggregate base material does not have sufficient fine particles to produce a surface that is free of exposed aggregate or surface voids greater than 1/2" in size at time of slab installation.
  4. For concrete placements larger than 10,000 square feet, Wal-Mart Construction Testing Laboratory shall verify adequate fines at surface prior to concrete slab placement.
  5. Provide dry, smooth, flat, dense surface
- D. Slab on Ground Aggregate Base Fine Grade Tolerance: +0 inch, -3/4 inch with transition no greater than 3/4 inch vertically to 8 inches horizontally for level slab.

### 3.4 FORMWORK

- A. Form vertical surfaces of concrete work.
- B. Design, construct, erect, support, and remove formwork and related items in accordance with most stringent requirements of ACI 117 and 347.
- C. Form Preparation
  1. Clean formwork.
  2. Remove rust from steel formwork.
- D. Erecting Forms:
  1. Solidly butt joints and provide backup at joints as required to prevent faulting at form.
  2. Do not tape formwork joints.
  3. Just before placing concrete, clean forms and adjacent surfaces again as necessary. Remove wood, sawdust, chips dirt and other debris.
  4. If necessary to grease tie threads, do not allow grease to contact remainder of tie when wall will be exposed to hydrostatic pressure.
- E. Form Release Agent
  1. Before placing reinforcing steel, thoroughly coat contact surfaces of forms with form release agent.
  2. Apply form release agent evenly without excess drip.
  3. Do not allow form release agent to come into contact with concrete surfaces against which fresh concrete will be placed.

4. Moisten wood forms immediately before placing concrete where form release agents are not used.

F. For concrete placements larger than 10,000 square feet, provide slab side forms, of form materials specified, full depth, with beveled, level, and smooth top surface for all slabs where SOV is greater than FF 35 / FL 25.

G. Provide slab side forms such that by placing a 10-foot straightedge, form does not exceed 1/8 inch variation.

H. Prefabricated Access Pit Form: Install in accordance with manufacturer's instructions.

### 3.5 VAPOR RETARDER INSTALLATION

A. Install vapor retarder only under slabs where shown on drawings.

B. Lap vapor retarder not less than 6 inches with top lap placed in direction of placing concrete.

C. Seal laps continuously with specified tape.

D. Seal punctures and tears in membrane caused by bar chair feet, screed anchors, or utility penetrations with specified tape.

### 3.6 PLACING REINFORCEMENT

A. Place reinforcing in accordance with most stringent requirements of ACI 117, 301 and CRSI Manual of Standard Practice and Placing Reinforcing Bars.

B. Accurately place and secure reinforcement against displacement by firmly wiring at intersections and splices with not less than No. 18 U.S. Standard Gauge annealed wire.

C. Turn wire ends away from concrete exterior.

D. Ensure reinforcing is clean, free from defects and kinks, loose mill or rust scale or coatings that will reduce bond.

E. Protect exposed reinforcing bars, inserts and plates intended for bonding with future expansion from corrosion.

F. When welding of reinforcement is specified, comply with AWS D1.4. Do not tack weld crossing bars for assembly of reinforcement, supports or embedded items.

G. Dowel Installation:

1. Install joint reinforcing as detailed on drawings.

2. Secure dowels and their support devices (if applicable) perpendicular to joint and parallel to finished concrete surface.

3. Dowel alignment shall be within specified tolerances.

4. Install plate dowels at formed construction joints in accordance with manufacturer's recommendations.

5. Install smooth round dowels at formed construction joints centered on joint with grease on one end or dowel sleeve.

6. See structural drawings for dowel installation where replacement slabs abuts existing.

### 3.7 EMBEDMENTS

A. Install anchor bolts and embedded bearing devices provided by others.

B. Provide other anchor bolts and bearing devices shown on Drawings or anchor bolt setting plans or required equipment installation.

C. Use templates as required for spacing between anchor bolts and set elevations with surveying equipment.

- D. Position and anchor steel shapes, anchor bolts, casings, conduit sleeves, masonry anchorages and other materials embedded in concrete.
- E. Place and secure against displacement miscellaneous steel, pipe sleeves, inserts, anchors, stair abrasive nosings, preformed joint fillers, vapor retarders and miscellaneous embedded items.
- F. Secure embedments to formwork when possible.
- G. Install clean embedments. After concrete placement, clean embedment exposed surfaces of concrete splatter and other foreign substances.
- H. Unless noted otherwise on the Drawings, ensure corner protection angles, bars and other similar embedded metal items are continuous between concrete joints. If shorter lengths are required for metal items, connect the ends by butt-welding entire joint and grinding smooth exposed surface. Ensure embedded metal items are discontinued at construction, contraction and isolation joints.
- I. Temporarily fill voids in sleeves and inserts with easily removable materials.
- J. Allow sufficient time between erection of forms and placing concrete for other trades to install and test their work.
- K. Before placing concrete on grade, piping and other utilities under concrete shall be inspected, tested, and excavations backfilled and properly compacted to solid bearing.

### 3.8 CONVEYING

- A. Handle concrete from mixer to place of final deposit as rapidly as practicable and in manner which will assure obtaining specified quality of concrete.
- B. Re-tempering: Discard concrete which has already begun to set. Do not re-temper with water.
- C. Equipment: Provide mixing and conveying equipment of proper size and design to ensure a continuous flow of concrete to delivery end. Do not use aluminum equipment in contact with concrete.
  - 1. Mixers, agitators and non-agitating units: Conform to ASTM C94 and current certification requirements of Department of Transportation in state where concrete plant is located.
  - 2. Belt Conveyers:
    - a. Use only types which will not cause segregation.
    - b. Discharge runs over 30 feet into hopper
  - 3. Chutes: Metal or metal lined not to be installed at slopes greater than 1 vertical to 3 horizontal.
  - 4. Runways:
    - a. Provide runways or other means above finished concrete level for wheeled conveying equipment.
    - b. Do not support runways on reinforcing.
    - c. Do not wheel equipment directly over reinforcing or metal deck.
  - 5. Pumps:
    - a. Placing concrete via pump is not acceptable.

### 3.9 PLACING CONCRETE

- A. Unless otherwise specified, place concrete in accordance with the requirements of ACI 301.
- B. The concrete supplier shall have a quality control representative at site for concrete placements.
- C. General Contractor and/or the Concrete Floor Subcontractor representative shall be on site during placement of the concrete.
- D. The concrete supplier shall have a quality assurance representative at the site for the entire duration of each concrete slab placement as a resource to the Contractor.

- E. Supervision for the General Contractor and the Concrete Floor Subcontractor shall be on site for the entire duration of each concrete slab placement.
- F. Depositing
  1. Do not deposit concrete which has partially hardened or has been contaminated by foreign matter.
  2. Deposit concrete continuously in layers of such thickness that no concrete will be deposited on concrete which has hardened sufficiently to cause seams or planes of weakness.
  3. Between construction joints, place concrete in a continuous operation such that concrete is plastic at all times and flows readily into spaces between reinforcement.
  4. Use placement procedures to avoid segregation.
  5. Deposit concrete as near as possible to its final position.
  6. Hardened/Densified Floor Slabs: Place concrete in one continuous placement up to a maximum of 3,000 square feet. Placement over 3,000 sq ft may be performed provided written approval by Wal-Mart is obtained contingent upon the Contractor's demonstration of ability, equipment, and personnel to handle the increased areas.
  7. Integral color concrete floor slabs:
    - a. Clean tools to prevent contamination. Clean and bag boots when working on surface.
    - b. Employ methods to prevent dust and air-born debris from entering building and settling on slab surface during finishing operations.
  8. Do not place concrete over standing water, mud, frost, ice or snow.
  9. Do not use wet screeds.
- G. Consolidation:
  1. Consolidate concrete complying with ACI 301 by vibrating, spading or rodding so that concrete is thoroughly worked around reinforcing, embedded items and into the corner of forms.
  2. Consolidate each layer of concrete with previously placed layers in manner that will eliminate air or stone pockets which may cause honeycombing, pitting or places of weakness.
  3. Do not insert vibrator into portions of concrete that have begun to set.
  4. Do not use vibrators to transport concrete.
  5. Keep spare vibrator on job site during concrete operations.
  6. Use internal vibrator for formed elements, not form vibrators.
  7. Slabs:
    - a. Consolidate slabs with vibrating screed.
    - b. Use internal vibration along construction joints at both formed and slab abutments. Vibrate under plate dowels. Mark forms before concreting to properly locate dowels after concreting.
    - c. Do not use grate tampers, jitterbugs, or mesh rollers.
- H. After concrete placement, adjust forms and bracing as necessary to maintain proper alignment and eliminate leakage of cement paste.

### 3.10 FLOOR SLAB FINISHING PROCEDURES

- A. General:
  1. Do not add water to any slab surface during finishing operations.
  2. Do not add cement to any slab surface during finishing operations.
  3. Perform no finishing operation while water is present on slab surface.
- B. Initial Leveling:
  1. Complete bull floating, darbying and straight-edging before any bleed water is present on slab surface.
  2. Use a checkrod or highway straightedge 10 feet wide minimum for initial and later leveling instead of bull float where overall floor tolerances specified are greater than FF 20 / FL15.
- C. Hand and Power Floating:
  1. Do not start floating until following conditions are met:
    - a. Bleeding is complete and water is gone, including water sheen on slab surface.
    - b. Mortar is not thrown by rotating blades of power float.
  2. The finisher shall determine the proper time to start finishing procedures for interior slab placements on the

basis the above conditions. It is noted for advisory purposes, however, that typical setting of concrete materials will allow for initial power floating to begin 3-1/2 hour's  $\pm$  1 hour after initial strike-off (screeding), at which time the concrete should support a finisher on foot without more than approximately a 1/4 inch indentation in the slab surface. Variations in concrete materials, nature and proportion of supplementary cementing materials, and concrete temperature will cause setting behavior to vary.

- D. Troweling for Interior Slabs:
1. Hand or power float floor before starting troweling.
  2. For first troweling, keep blade as flat as possible and use low speed, minimizing "washboard" or "chatter marks" and "pitting".
  3. Trowel two times minimum with first two trowelings at right angles. Some burn marks are acceptable. Cease troweling before trowel blades scratch surface.
  4. Allow time between trowelings for concrete to stiffen and water sheen to disappear.
  5. Do not add water to slab surface during troweling.
  6. Do not run trowel machines on existing hardened concrete slabs. Trowels shall be carried off of slab surfaces. When parking power trowels on fresh concrete, place on top of plywood or spray area with evaporation retarder before placing trowel on top of slab.
  7. Trowel as many times as possible to enhance surface sheen, without scratching the slab surface.
  8. Lead finisher/foreman who finished the field sample shall be present for entire fresh concrete finishing process until final troweling is completed.
- E. Pitch to drains: Form 18 inch radius around floor drains and pitch concrete surface to drains at rate of 1/4 inch per foot nominal, unless noted otherwise in Drawings.

### 3.11 CONCRETE FINISHES

- A. Scratched Finish: After floating, as specified, lightly scratch surface with stiff brush.
- B. Troweled Finish:
1. After floating as specified, power trowel or hand trowel surface.
  2. Ensure kneeboard impressions, trowel marks or chattered areas are not evident after floor is finished.
  3. Provide dense, smooth surface uniform in texture. Random, mottled burn marks are desirable and acceptable.
  4. Finish surface to produce maximum sheen free of scratches and trowel marks.
- C. Broom Finish:
1. Draw flexible bristle broom across surface to produce non-slip texture.
  2. Broom in direction transverse to traffic or at right angles to slope of surface unless otherwise shown.
- D. Floor Finish Schedule:
1. Scratched Finish:
    - a. Use for surfaces to receive mortar setting beds for tile and other bonded applied cementitious finish flooring materials, except bonded concrete floor toppings.
  2. Troweled Finish:
    - a. Use for exposed interior walking surfaces and surfaces to be covered with carpet, resilient flooring and other thin film finish coating systems.
- E. Use the following bonding procedure for bonding new concrete to existing concrete and as noted on Drawings:
1. Roughen surface until coarse aggregate is exposed.
  2. Clean surface.
  3. Immediately before placing concrete, clean surface again as necessary, dampen surface and remove free water.
  4. Apply a commercial epoxy bonding agent or apply bonding grout approved by the engineer composed of one part cement, 1.5 parts fine sand with 100% passing No. 8 sieve, and a 50:50 bonding admixture with water to achieve the consistency of thick paint. The W/cm for the bonding admixture shall not exceed that of the new concrete being placed on it.

### 3.12 JOINTS

- A. Joints
1. Provide construction, isolation and contraction joints as indicated on Drawings and as noted below.
  2. Bulkheads for construction joints shall be 1-1/2 inch minimum lumber with top outside edge beveled 30 degrees minimum, leaving 1/2" to 3/4" level surface. Do not use permanent preformed metal bulkheads.
  3. Provide bulkheads full depth of member.
  4. Space joints to allow one continuous placement between bulkheads.
  5. Maximum length-to-width ratio for concrete panels defined by walls or joints shall be 1-1/2:1.
  6. Do not locate longitudinal construction joints in action alleys.
  7. Unless otherwise shown on the Drawings, do not extend reinforcement, corner protection angles, bars or other fixed metal items through construction joints in slabs on grade or pavements or through joints between slabs on grade and vertical surfaces.
  8. Match joints in walls and curbs with joints in slabs on grade and pavements.
  9. Extend joints across tops of walls and curbs unless noted otherwise on Drawings.
  10. Isolation Joints: Form isolation joints in accordance with Section 07900.
  11. Verify joint cleanout methods include HEPA-rated filter systems as specified herein.
- B. Provide slab joints as indicated on Drawings.
1. Use saws, blades, skid plates, and accessories by Soff-Cut (800) 288-5040 or approved equal.
  2. Provide at least two Soff-Cut saws with blades capable of achieving the required depth of saw cut. Employ number of saws and workers sufficient to complete cutting saw joints before shrinkage produces cracking.
  3. Start cutting sawed joints as soon as concrete has hardened sufficiently to prevent raveling or dislodging of aggregates. This will typically be from 1 hour in hot weather to 4 hours in cold weather after completing finishing of slab in that joint location.
  4. Adhere felt or similar material to the bottom of the saw base plate as necessary to minimize surface scratching and debris build up.
  5. Saw cut to width of 1/8 inch by 1/4 the slab depth, unless noted otherwise on drawings.
  6. After saw cutting with attached vacuum system, immediately clean slab surface of all sawing residues using vacuum with HEPA-rated filter.
  7. Extend sawed joint to the slab boundaries and abutments, including columns, drains, and other penetrations in the path of a defined joint. Implement methods and timing of the saw cut beyond the limits of the Soff-Cut saw reach to provide a consistent depth of cut with minimal raveling of joint edges.
  8. See Drawings for additional requirements.
- C. Saw-Cut Control Joint Dust Collection: Connect one of the following dust collection systems directly to each Soff-Cut saw being used. Provide collection system model recommended by the manufacturer to maintain dust emissions below the permissible level. Immediately clean any remaining residue after cutting, prior to cure.
1. Pulse Vac by BW Manufacturing.
  2. DustDroid by Dustless Technologies.
  3. Soff-Vac by Husqvarna USA.
  4. Substitutions: Not permitted.
- D. Joint filling and sealing of concrete floors is specified in Section 07900.

### 3.13 CONCRETE CURING

- A. Curing Compound (Temporary Film Forming):
1. Apply curing compound after saw joints have been cut and as soon as concrete surface will not be damaged by curing operations.
  2. Clean slab surface and joints using vacuum with HEPA-rated filter and remove loose or compacted saw debris prior to curing compound application.
  3. Apply compound at a rate of 800 to 1000 square feet per gallon with high volume, low pressure, atomizing sprayer in accordance with manufacturer recommendations. Prevent over-application in excess of specified rate.
  4. Spread compound evenly using mopping pads.
    - a. Mopping pads shall be Quickie Professional Mighty Mop 077 or Rubbermaid 24" Microfiber Wet Room Pad.
  5. If whitening from over application occurs, consult manufacturer for removal of product with hot water and

- aggressive scrubbing.
- 6. Do not allow compound to accumulate and puddle.
- 7. Do not use polyethylene sheets or other impervious covers on exposed interior floors.

### 3.14 FORM REMOVAL

- A. Do not remove forms until concrete has hardened sufficiently to support its own weight and imposed construction loads.
- B. Remove forms in manner to avoid damage to concrete.
- C. Formwork for slabs and pavements, curbs and other parts not supporting vertical load of concrete may be removed as soon as concrete has hardened sufficiently to resist damage from removal operations, but in no case sooner than 12 hours.

### 3.15 JOINT SEALING / FILLING

- A. Joint filling and sealing of concrete floors are specified in Section 07900.

### 3.16 DENSIFIER APPLICATION

- A. Area to be Treated: Apply densifier to all interior concrete floors except floors exposed to Customer view, floors with color textured concrete finishes and floors to receive other final floor finish such as epoxy resin, or resilient flooring.
  - 1. Application of reactive surface colorant densifier and subsequent polishing for slabs exposed to Customer view are specified in Section 0336303931.
- B. Examination and Preparation:
  - 1. Examine surfaces receiving densifier. Verify that surfaces conform to product manufacturer's requirements for substrate conditions.
  - 2. Vacuum and clean saw cut joints and surrounding area so that no dust remains to react with concrete finish material.
  - 3. Remove remnant of temporary film forming curing compound prior to application of densifier. Remove compound by cleaning and scrubbing in accordance with manufacturer's instructions.
  - 4. Prior to application, scrub floor with pre-densifier floor cleaner to remove latent salts. Do not proceed until unsatisfactory conditions have been corrected.
  - 5. Beginning of application indicates acceptance of existing conditions.
- C. Application:
  - 1. Application shall be performed by certified applicator in accordance with manufacturers published instructions.
  - 2. Schedule to begin 7 days after floor slab placement.
  - 3. Employ methods to ensure concrete surface is not damaged during application, including discoloration.
  - 4. Apply densifier finish at the rate of 500 SF per gallon.
  - 5. Apply with low pressure sprayer with enough coverage to keep concrete surface wet for minimum 20 minute period.
  - 6. Remove residual remains of densifier due to improper application at no expense to Walmart.

### 3.17 FIELD QUALITY CONTROL

- A. Field quality control shall be the responsibility of the Contractor in accordance with Section 01452. Except as specified as mandatory, field quality control testing and inspection shall be at the discretion of the Contractor as necessary to assure compliance with Contract requirements. Owner T&I specified in Appendix B shall not preclude Contractor's responsibility to perform similar routine, necessary, and customary testing and inspection of the methods and frequency suitable for the type of work involved.



- B. Responsibilities and Duties of Contractor Relative to Owner Testing (For concrete placements larger than 10,000 square feet.):
  - 1. Notify CTL not less than 3 working days prior to placing concrete.
  - 2. Assist Owner's agency in securing field specimens
  - 3. Concrete Supplier and Aggregate Supplier shall have representatives available to assist CTL in obtaining representative samples.

3.18 OWNER TESTING AND INSPECTION (T & I)

- A. For concrete placements larger than 10,000 square feet, Owner will perform testing and inspection as specified in Appendix B (Section 03314).

3.19 CONCRETE PROTECTION

- A. Provide a "Concrete Floor Protection Plan" to Wal-Mart Construction Manager prior to placement of interior slabs that addresses how the following tasks will be implemented:
  - 1. Communication of protection plan to subcontractors and vendors, including those directly contracted by the Owner.
  - 2. Keeping the slab clean of dirt and grime.
  - 3. Prevention of stored materials in exposed sales floor areas until completion of construction.
  - 4. When and how floor covering protection will be provided in high traffic areas.
  - 5. Condition, inspection, and operational procedures for construction equipment allowed on the slab surface, including but not limited to:
    - a. Diapering to contain any potential fluid leaks.
    - b. Use of non-marking tires
    - c. Inspection of tire treads for any debris that may mar the slab surface.
  - 6. Procedures for cleaning up slab spills, including use of and availability of cleaning chemicals and absorptive materials at the site.
- B. Slab Protection:
  - 1. Protect finished floors to prevent damage by construction traffic and activities until Owner possession.
  - 2. Protect concrete slabs from staining, gouges, and scratching.
  - 3. Diaper hydraulic powered equipment.
  - 4. Place drop cloths or other breathable slab protection under parked vehicles.
  - 5. Do not store structural steel or metal fabrications on slab.
  - 6. Do not allow pipe cutting machine on slab.
  - 7. Adequately protect concrete inserts and other embedded items from movement, mechanical injury, or from damage by elements.
  - 8. Provide access ramps of compacted earth or other means along exposed concrete edges of floor slabs to prevent equipment and machinery from impacting edges. Barricade all other exposed edges to vehicular traffic which may damage edges.
- C. Traffic protect curing compound floor surfaces as follows:
  - 1. Barricade concrete surfaces immediately after placing and finishing.
  - 2. 3 full days (72 hours) after placement: Slab shall be open for normal store operations.
  - 3. 7 full days (168 hours) after placement: Heavy loading permitted but not before concrete has attained, by test, its design strength as noted herein. Approved 7 day compressive strength test report from Construction Testing Laboratory must be received by Wal-Mart Construction Manager prior to allowing heavy loading on slab.
- D. Provide daily scrubbing, using only water, of the entire surface of exposed concrete slab placed under this Specification with fuel powered riding equipment from time concrete has reached, by test, its design strength prior to initial application of surface densifier as specified.
- E. Dispose of construction waste in accordance with the requirements of Section 01351 Regulatory Compliance Supplement.

END OF SECTION

WAL-MART STORES  
 CONCRETE SLAB MIX DESIGN SUBMITTAL FORM  
 (Section 03314 – Cast-in-Place Concrete Slabs)

Date \_\_\_\_\_

DISCOUNT STORE  SUPERCENTER  NEIGHBORHOOD MARKET  SAM'S CLUB

SUBMITTED MIX DESIGN

Interior Building Slabs	
<input type="checkbox"/> 03314-SLC	Integrally <b>Colored</b> Concrete Mix ID # _____
<input type="checkbox"/> 03314-SLN	<b>Natural</b> Concrete (gray) Mix ID # _____

STORE INFORMATION

STORE #	_____
ADDRESS	_____
CITY, ST	_____
GENERAL CONTRACTOR	_____
COMPANY	_____
JOBSITE PHONE	_____

A. CONCRETE INFORMATION

Design Strength (f'c)	_____	psi
Water / Cement Ratio	_____	
Total Air Content	_____	%
Mix Developed From		
<input type="checkbox"/> Trial Mix Test Data (attach test data)		
<input type="checkbox"/> Field Experience (attach data)		
Density		
W	pc	pc
et _____	f	Dry _____
Slump		
“ _____	( ± 1” ) WITHOUT WR Admixture	
“ _____	( ± 1” ) WITH WR Admixture	

B. ADMIXTURE INFORMATION

	ASTM Designation	Product (Manufacturer/Brand)	Dosage (ounces)	
			oz / cy	oz / cwt
Water Reducing				
Accelerating				
Retarding				
Liquid Color				

C. MIX DESIGN

Mix Proportions (per cubic yard)

	Identification (Type, size, source, etc.)	Weight (pounds)	Density (SSD)	Volume (cubic feet)	% Aggregate Absorption
Cement					
Coarse Aggregate #1					
#2					
#3					
Fine Aggregate #1					
#2					
Water					
Air Content					
Liquid Color					
	TOTALS				

Coarse & Fine Aggregate Gradation Information

Sieve Size	% Passing Each Sieve (All Sieve Sizes must be entered)					Combined % Passing	Combined % Retained	
	Coarse Agg. # 1	Coarse Agg. # 2	Coarse Agg. # 3	Fine Agg. # 1	Fine Agg. # 2		Cumulative	Individual
1-1/2"								
1"								
3/4"								
1/2"								
3/8"								
# 4								
# 8								
# 16								
# 30								
# 50								
# 100								
# 200								
% of Vol								

Aggregate Ratios

Coarseness Factor =	$\frac{\text{Combined \% cumulative retained } 3/8'' \text{ sieve}}{\text{Combined \% cumulative retained } \#8 \text{ sieve}}$	=	
Workability Factor =	Combined % passing #8 sieve	=	
Adj-Workability Factor =	$\text{WF} + [(\text{Cement Material} - 564) \div 37.6]$	=	
Allowable Adj-WF=	$\text{Adj-WF} = [(11.25 - .15 \text{ CF}) + 36] \pm 2.5$	=	Low High

D. ATTACHMENTS: Include the following with this Mix Design Report.

- Mill test reports for Portland cement, and supplementary cementitious materials
- Designation, type, quality, and source (natural or manufactured) of coarse and fine aggregate materials
- Separate aggregate gradation reports including all required sieve sizes
  - Gradation sieve report tests dated within 60 days of this report
  - Report for each coarse and fine aggregate material in mix
- Statement if possible reactivity of aggregate, based on tests or past service
- Statement if possible aggregate pop-outs or their disruptions, based on tests or past service
- Product data for the following admixtures:  
Liquid color  
Water reducing, set retarding, set accelerating, etc.
- Concrete compressive strength data used for standard deviation calculations
- Measured water-soluble chloride ion content. (percent by weight of cement)

**E. CONCRETE SUPPLIER INFORMATION (FOR PLACEMENTS LARGER THAN 10,000 SQUARE FEET)**

Company Name		Tel. #	(    )
Address			
City, ST Zip			
Technical Contact		Cell #	(    )
		e-mail	
Sales Contact		Cell #	(    )

	PRIMARY PLANT	SECONDARY PLANT
Plant Location:		
Miles from Site:		
Travel Time to Site:		
NRMCA Certified:	<input type="checkbox"/> YES <input type="checkbox"/> NO	<input type="checkbox"/> YES <input type="checkbox"/> NO
State DOT Certified:	<input type="checkbox"/> YES <input type="checkbox"/> NO	<input type="checkbox"/> YES <input type="checkbox"/> NO
Batch Mixing Type:	<input type="checkbox"/> DRY <input type="checkbox"/> CENTRAL MIX	<input type="checkbox"/> DRY <input type="checkbox"/> CENTRAL MIX

CONTRACTOR'S QUALIFICATION STATEMENT OF CONFORMANCE  
SECTION 03314  
CAST-IN-PLACE CONCRETE SLAB  
(Required for all concrete placements larger than 10,000 square feet.)

Project Location: \_\_\_\_\_ Date: \_\_\_\_\_

Project Number: \_\_\_\_\_ Store Number: \_\_\_\_\_

By signing below as approved, the Contractor hereby confirms that the qualifications of the concrete finishing subcontractor conforms to the qualifications as follows:

The concrete floor finishing subcontractor Lead Finisher and two additional members of the finishing crew are certified under the Concrete Flatwork Finisher Training and Certification Program as granted by the American Concrete Institute. (Attach Certificates)

The concrete floor finisher subcontractor has experience in finishing interior floors of similar size and scope in at least 5 previous projects. Projects name and location are identified as follows

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

Submit one copy to the Wal-Mart Construction Manager.  
Concrete Finishing Contractor Company Name and Address:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Signature of Responsible Officer: \_\_\_\_\_

Typed Name and Title of Officer: \_\_\_\_\_

Telephone Number: ( \_\_\_\_\_ ) \_\_\_\_\_

General Contractor Company Name and Address:

\_\_\_\_\_  
\_\_\_\_\_

Signed by: \_\_\_\_\_ Date: \_\_\_\_\_

Submit one copy of this Statement to the Architect

CONCRETE SUBMITTAL REGISTER (ALL CONCRETE PLACEMENTS)		
SUBMITTAL	SUBMIT TO	SUBMITTAL DUE
Sieve Analysis for Aggregate Base System <ul style="list-style-type: none"> <li>Aggregate Base Material</li> <li>Choker Material</li> </ul>	Architect (by email) Wal-Mart Construction Testing Laboratory (CTL) (by email)	30 days after award of Contract.
Concrete Mix Design <ul style="list-style-type: none"> <li>One mix for all interior slabs</li> <li>Submit on form provided</li> <li>Required Attachments</li> </ul>	Architect (by email) Wal-Mart Construction Testing Laboratory (CTL) (by email)	30 days prior to first pour
Product Data <ul style="list-style-type: none"> <li>Dowels at construction joints.</li> <li>Dowels at sawed joints (if specified)</li> <li>Vapor retarder (if specified)</li> <li>Curing compound</li> </ul>	Architect  Wal-Mart Construction Testing Laboratory (CTL)	30 days prior to first pour
Slab Jointing and Placement Plan <ul style="list-style-type: none"> <li>Placement sizes / sequencing</li> <li>Joint Types and Locations</li> </ul>	Architect Wal-Mart Construction Testing Laboratory (CTL)	30 days prior to first pour
Interior Slab Reinforcing (if specified) <ul style="list-style-type: none"> <li><i>Perimeter foundation tie reinforcing submittals are submitted under Section 03310.</i></li> </ul>	Architect Wal-Mart Construction Testing Laboratory (CTL)	30 days prior to first pour
CONCRETE SUBMITTAL REGISTER (CONCRETE PLACEMENTS LARGER THAN 10,000 SQUARE FEET)		
SUBMITTAL	SUBMIT TO	SUBMITTAL DUE
Concrete Contractor Qualifications Letters <ul style="list-style-type: none"> <li>Qualification Statement</li> <li>3 ACI Finisher Certifications</li> </ul>	Architect	30 days prior to first pour
Concrete Batch Plant Quality Certification <ul style="list-style-type: none"> <li>NRMCA Certification</li> <li>DOT Certification</li> </ul>	Architect	30 days prior to first pour
Pre-slab Installation Meeting <ul style="list-style-type: none"> <li>Record of notification (schedule with SSI)</li> <li>Meeting agenda</li> <li>Meeting minutes</li> </ul>	SSI Wal-Mart Construction Manager Wal-Mart Construction Testing Laboratory (CTL)	3 days after meeting.
Statement of Acceptance of Concrete Supplier	SSI	At or prior to Pre-slab meeting.
Delivery Tickets	Wal-Mart Construction Testing Laboratory (CTL)	With delivery of each load
Closeout Submittals	See Section 01770	See Section 01770

## SECTION 03366 – PVC/VCT REMOVAL AND POLISHED CONCRETE FLOOR FINISHES FOR INTERIOR SLABS

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Unless otherwise specified, provisions specified herein for products and execution furnished by Owner are requirements for Owner's Preferred Flooring Contractor and are included as information only to General Contractor.
- B. Section Includes:
1. For existing interior slabs:
    - a. Removal of existing floor finishes (sealers, coatings, tile, etc.) and underlayments, as necessary.
    - b. Interior concrete slab surface enhancement.
      - 1) Progressive wet polishing of slab surface using propane powered planetary or multi-head rotary polishing equipment and approved diamond segments to achieve specified Finish Requirements.
      - 2) Application of reactive densifier, stain protector and burnishing to specified Finish Requirements.
  2. For new interior slabs installed in accordance with the requirements of Section 03314.
    - a. Progressive wet polishing and burnishing of slab surface, including application of penetrating stain protector, to specified Finish Requirements.
  3. Allocation of Preferred Flooring Contractor, General Contractor, and Store Planning responsibilities as described in Part 1 herein.
- C. Related Requirements: Related Requirements: The following list is intended to aid in locating work related to or dependent on the scope of Work in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
1. Section 01330 - Submittal Procedures: Procedures for submittals.
  2. Section 01351 - Regulatory Compliance: Waste management and disposal.
  3. Section 01500 - Temporary Facilities and Controls: Requirements for control of substances that have the potential for polluting surface and/or groundwater. Requirements for storage of materials and equipment at the project site.
  4. Section 01700 - Execution Requirements: Requirements for use of electrical and propane powered equipment.
  5. Section 01770 - Contract Closeout
  6. Section 03314 - Cast-in-Place Concrete Slabs (Interior).
  7. Section 03905 - Interior Concrete Slab Repairs and Joint Filler Replacement.
  8. Section 03931 – Interior Concrete Slab Surface Enhancement
  9. Section 09650 – Resilient Flooring

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. American Society for Testing and Materials:
1. ASTM D 1455 Standard Test Method for 60° Specular Gloss of Emulsion Floor Polish
- C. Concrete Polishing Council (CPC).
- D. Occupational Safety and Health Administration (OSHA):
1. OSHA 01926.1153 Respirable Crystalline Silica.

## 1.3 OWNER'S PREFERRED FLOORING CONTRACTOR (PFC):



- A. The Owner's Preferred Flooring Contractor is a firm hired by and contracted by the Owner for the purpose of executing work within the scope of this section. The PFC shall be one the following as determined by Owner:
  - 1. Budget Maintenance, Pottstown, PA, (610) 323-7702. Contact: John Jones.
  - 2. Refuse Materials, Inc., Ocilla, GA, (229) 468-9822. Contact: DA Pope.
  - 3. Jones Tile, Roach, MO, (573) 346-3862. Contact: Robert Jones.
  - 4. A and I Floor Covering, Inc., Murray, UT, (801) 509-9587. Contact: Adam DiFabrizio.

#### 1.4 PREFERRED FLOORING CONTRACTOR RESPONSIBILITIES

- A. Provide labor, material, equipment, and services necessary to perform the work in this section.
- B. Conduct work in manner as to minimize disruption of Owner's normal operations.
- C. Administrative and Scheduling Requirements:
  - 1. Coordinate project phasing and relocation of racking, shelving, or merchandise to ensure minimum interference with other aspects of the Work. This may require multiple visits to job site on a given project.
  - 2. Work shall begin no earlier than 15 minutes before approved start time and shall finish within one hour after approved completion time. Coordinate start time and completion time of daily work specified herein with Owner's Construction Manager and Store Manager.
  - 3. Attend morning communication meetings (lead installer).
  - 4. Track material usage and ensure quantities on hand are sufficient for Work.
  - 5. Submit Weekly Flooring Installation Report to Contractor and Walmart Construction Manager each Friday.
  - 6. Submit any required Flooring Add-on Order forms. Expedited freight charges incurred by add-on orders will be charged to PFC. Contact Walmart Construction Manager for required forms.
  - 7. When necessary or requested, advise Store Planning or General Contractor in phasing and scheduling.
  - 8. Coordinate with Contractor for selecting the staging location for the materials included in the scope of the work.
- D. Existing Materials Management:
  - 1. Move the removed VCT/PVC flooring materials from the sales floor to the agreed upon staging area.
  - 2. Slurry Disposal:
    - a. Coordinate scheduling, delivery, and pickup of slurry disposal with waste management and Contractor.
    - b. Pay for slurry disposal.
- E. Return to project site 7-14 days prior to Re-Grand Opening to complete required corrections related to work specified herein.

#### 1.5 GENERAL CONTRACTOR RESPONSIBILITIES

- A. Provide temporary electrical service as specified in Section 01500 for PFC's equipment.
  - 1. Prior to submission of bid, determine Owner's designated PFC for project. Coordinate with PFC to evaluate temporary electrical requirements.
- B. Coordinate disconnecting and reconnecting electrical power to existing equipment and fixtures, including registers, which are scheduled to be moved for installation of flooring.
- C. Attend Pre-Possession meeting to advise in development of flooring installation and finishing schedule (Floor Phasing Plan and Schedule).
- D. Existing Materials Management:
  - 1. Move the removed VCT/PVC flooring materials from staging area to the Contractor provided Conex storage box.
    - a. If the removed VCT/PVC materials are scheduled to be stored in a Store Planning Fixture or Regional warehouse after leaving the staging area, see Store Planning Responsibilities herein.
  - 2. Initiate contact with Owner's VCT/PVC recycling firm to coordinate transportation of removed flooring to the recycling site. Process and return the recycling firm's required paperwork.

3. Owner's recycling firm will schedule Walmart Transportation to reach the store site 7-10 business days from initial contact. Move the VCT/PVC materials from the Conex box to the Walmart Transportation freight trailer for transport to the recycling site.

E. Slurry Storage Fencing and Monitoring:

1. Provide fencing around slurry bins and any associated storm water BMPs.
2. Unlock slurry fence area during daytime hours for slurry disposal pickup as coordinated with the PFC.
3. Monitor and report incidents on any qualifying spills.

F. Supervise flooring scope of work, including but not limited to:

1. When necessary or requested, coordinate with and advise Store Planning, CM, or PFC in phasing and scheduling.
2. Ensure Phasing Plan schedule is followed (Sequence of moves, daily flooring minimums, etc.).
3. Ensure conformance (quality expectations) with contract documents.

G. Perform Final Cleaning and Protection as specified in Part 3 herein.

## 1.6 STORE PLANNING RESPONSIBILITIES

A. Floor Phasing Plan and Schedule: Develop, produce, and lead the Floor Phasing Plan and Schedule as described in Part 1 Quality Assurance herein.

B. Storage of Removed VCT/PVC Materials: In some cases, the removed VCT/PVC materials are scheduled to be stored at a Store Planning Fixture or Regional warehouse prior to being transported to the recycling facility.

1. If the removed VCT/PVC is to be transported to a Store Planning Fixture or Regional warehouse, Store Planning will move the VCT/PVC materials from the staging area to the Fixture or Regional warehouse.
2. Store Planning will coordinate with Owner's recycling firm and process the recycling firm's required paperwork.

## 1.7 SUBMITTALS

A. Product Data Sheets:

1. High pH Cleaner: Brand name, chemical composition, dilution rate, installation directions and certificates of compliance with required standards, if applicable.
2. Reactive Surface Densifier, Stain Protector and Densifier System: Brand name, chemical composition, installation directions and certificates of compliance with required standards.

B. Manufacturer and model numbers of all equipment to be used (as specified):

1. All polishing machines.
2. Manufacturer and model of diamond polishing segments. Product data and procedure of polishing must be submitted for verification of compatibility, prior to beginning slab enhancement work.
3. High speed burnishing equipment, including burnishing pads. Product data for pads must be submitted for verification of pad texture prior to beginning burnishing work.
4. Scrubber machines.
5. Concrete slurry waste disposal. Refer to Section 01500.

## 1.8 CLOSEOUT SUBMITTALS

A. Comply with the requirements of Section 01770.

B. Product and Equipment Data: Submit the following manufacturer's data for products and equipment used in the specified enhancement process:

1. Manufacturer's technical product data and literature.
2. Storage and handling requirements and recommendations.
3. Manufacturer's safety data sheets and related safety requirements.
4. Product and equipment manufacturer's recommendations for slab maintenance.

- C. Floor Phasing Plan and Schedule as described in Part 1 Quality Assurance herein, submitted in PDF format.
- D. PFC's maintenance recommendations including:
  - 1. Maintenance schedule and frequency.
  - 2. List of approved cleaning and stain removal products and procedures.
  - 3. Precautions for cleaning materials and methods that could be detrimental to burnished slab finish.
- E. PFC's Completion Quality Control Test Results as specified in Part 3 herein.

#### 1.9 QUALITY ASSURANCE

- A. Floor Phasing Plan and Schedule: Prior to commencement of work, Store Planning will produce a Floor Phasing Plan and Schedule developed using Owner's most current Drawings (Sheet A1 "Slab Finish Plan").
- B. Floor Phasing Plan and Schedule shall be a detailed program describing the overall intent and agenda of the polishing scope including:
  - 1. Location of all cracks, spalls and other surface defects requiring repairs in accordance with Section 03905. Include quality color digital photographs of sufficient quantity as to illustrate necessary repairs. Images shall be emailed to Owner's Construction Manager and Architect of Record.
  - 2. Locations of weekly gloss measurements taken in prior scopes.
  - 3. Concrete slurry waste disposal location.
  - 4. Unique work requirement locations (i.e. joint repairs, floor patching, etc.).
  - 5. Scheduling: Include in the Floor Phasing Plan a detailed written schedule for sequence of work which ensures uninterrupted progress of Owner's concurrent operations.
    - a. Include anticipated start and finish date of work.
    - b. Show size, location and anticipated progression of individual nightly work areas, forecasted one week from current date of submission.
  - 6. Coordinate approval of Floor Phasing Plan and Schedule with Owner's Construction Manager and Store Manager.
- C. Manufacturer's Field Representatives: At the request of Owner's Construction Manager or Owner's Independent Concrete Consultant, manufacturers' technical representatives shall be on site to oversee work specified herein to verify proper use of products and equipment.

#### 1.10 DELIVERY, STORAGE, AND HANDLING

- A. Transport, handle, store, and protect products in compliance with the requirements in Division 1 and manufacturer's recommendations.
- B. Deliver materials to site in original, factory sealed, unopened, new containers (drums) bearing manufacturer's name and label intact and legible, with the following information:
  - 1. Name or title of material.
  - 2. Manufacturer's standard container (drum) numbers.
  - 3. Application instructions.
- C. Storage:
  - 1. Refer to Section 01500.
  - 2. Store materials in protected and well-ventilated area at temperatures between 40 and 90 degrees F unless otherwise required by manufacturer. (Provided by General Contractor for use by the PFC).
  - 3. Keep containers sealed until ready for use.
  - 4. Do not use materials beyond manufacturer's shelf life limits.
- D. Handling: Protect materials during handling and application to prevent damage or contamination.
  - 1. Dispense penetrating liquid densifier only from factory sealed and numbered containers (drums).
  - 2. Maintain record of container (drum) numbers received and used during floor treatment.

### PART 2 - PRODUCTS

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## 2.1 MANUFACTURERS

- A. Subject to compliance with project requirements, provide products and equipment by the following:
1. Ameripolish, (800) 592-9320, [www.ameripolish.com](http://www.ameripolish.com).
  2. Concrete Polishing Solutions (877) 472-8200 [www.go2cps.com](http://www.go2cps.com)
  3. Husqvarna (800) 288-5040 [www.husqvarna.com](http://www.husqvarna.com)
  4. Onyx Environmental Solutions (800) 858-3533 [www.onyxolutions.com](http://www.onyxolutions.com)
  5. Pioneer Eclipse (800) 367-3550 [www.pioneer-eclipse.com](http://www.pioneer-eclipse.com)
  6. SASE Company, Inc. (800) 522-2606 [www.sasecompany.com](http://www.sasecompany.com)
  7. Substrate Technology, Inc. (815) 941-4800 [www.substratetechnology.com](http://www.substratetechnology.com)
  8. Superabrasive, Inc., (800) 987-8403, <http://www.superabrasive.com/>
  9. Superior Surface Solutions, (888) 471-5227 [www.superiorsurfacesolutions.com](http://www.superiorsurfacesolutions.com)]
- B. Substitutions: Comply with the requirements of Section 01600.

## 2.2 EQUIPMENT

- A. Use of Owner's equipment is not allowed.
- B. Auto Scrubber Machines: Equipment used for cleaning operations shall be Clark Encore Max38 or L38 with a head pressure of 150 lbs. or similar equipment as required to achieve the specified Finish Requirements.
- C. Propane Polishing Equipment:
1. Propane polishing machines shall be in full operating condition during the duration of the night's work as required to achieve specified Finish Requirements.
  2. Polishers shall have minimum 650 pounds down force.
- D. Diamond Segments:
1. Diamond grinding heads shall be by one of the following manufacturers. Use heads from same manufacturer throughout entirety of project.
    - a. HTC.
    - b. John Don
    - c. SASE, Inc.
    - d. Substrate Technology, Inc.
    - e. Superabrasive, Inc.
    - f. Superior Surface Solutions.
  2. Diamond Segment Grit Sizes (or Manufacturer's Equivalent Designations):
    - a. Metal bonded diamonds: 40, 60, 80, 150
    - b. Hybrid Style Diamonds: 80,100, 120 and 200
    - c. Resin Bonded, Phenolic Diamonds: Progression of all polishing steps shall include sequential grit sizes that are not greater than twice the previous grit used.
- E. High speed propane burnisher: Equipment shall meet the specified minimum performance requirements.
1. Head Size: 21 or 27 inch.
  2. Head Weight: 22 pound (40 pound maximum).
  3. Engine Size: 585 cc, generating 1,500 RPM or higher (as verified with tachometer).
  4. Dust skirt assembly.
- F. Burnishing Pads:
1. Diamond Impregnated Pads (DIP): 1500 and 3000 grit.
  2. Diamashine Diamond Impregnated Pad by Superior Surface Solutions
  3. CASH Diamond Impregnated Pad by Substrate Technology, Inc.
  4. Twister Diamond Impregnated Pad
- G. Sprayer for Reactive Surface Densifier: Carbon dioxide sprayer as follows.
1. Patriot SpraySafe System, by Patriot Sprayer Systems. Provide Red #6 spray tip - 6.4 gallons per hour.

## 2.3 PRODUCTS

- A. Joint Filler Products: Polyurea joint filler as specified in Section 03905.
  - 1. Color: Match polished slab surface. Sample installed in mock-up shall be approved by Walmart Construction Manager.
- B. Slab Repair Products: Slab repair materials are specified in Section 03905.
- C. High pH Cleaner:
  - 1. [Rejuvenating Cleaner](#) by Ameripolish.
- D. Reactive Surface Densifier: Hybrid silicate densifier. Clear, abrasion-resistant surface. Colorless, odorless, water-based solution, <50 VOC.
  - 1. [3D HS Densifier](#) by Ameripolish.
- E. Stain Protector: Clear, abrasion and chemical resistant surface penetrating concrete chemical stain protector, <40 g/l VOC. Do not use water based products.
  - 1. [SR2](#) by Ameripolish.
    - a. Temporary Substitution: Provide [SR2 Plus](#) by Ameripolish as an acceptable substitution for any application of SR2 specified within the scope of this Section if Suppliers indicate SR2 is unavailable.
- F. Color Solvent for Dyes: Solvent carrier designed for use with dye.
  - 1. ColorSolve by Ameripolish.
- G. Dye: Colorant designed for diamond polished concrete.
  - 1. Classic Midnight Black by Ameripolish.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine concrete slab with Owner's Construction Manager. Verify that floor is in substantially the same condition as described in the Floor Phasing Plan.
  - 1. Identify and mark additional repair locations not shown in Floor Phasing Plan.

### 3.2 PREPARATION

- A. Close areas to traffic during and after floor finish application for time period recommended by product manufacturer(s).
- B. Cover and protect merchandise and racking to prevent damage or contamination of stored products. Protect merchandise from concrete slurry or debris.
- C. Clean Substrate: Remove existing floor finishes to bare concrete slab.
  - 1. Do not use hazardous materials or flammable, toxic, or solvent-based cleaning products.
  - 2. Remove curing or sealing compounds, paint, and wax.
  - 3. Remove surface contaminants such as oil, grease and general soiling with high pH cleaner/degreaser diluted as recommended by manufacturer using swing machine with red or black pads. Use appropriate pad to achieve desired results while not exposing coarse aggregate or excessive sand within paste layer.
  - 4. Thoroughly rinse floor surface with clean water to remove soap residue and contaminants. Vacuum with auto scrubber.
  - 5. Squeegee dry.
- D. Remove and replace existing deficient joint filler within the limits of required slab polishing and as shown on Drawings, in accordance with Section 03905.

- E. Repair slab defects within the limits of required slab polishing in accordance with Section 03905. Correct previous repairs not conforming to requirements of Section 03905, including any repairs not matching adjacent slab surface, in accordance with Section 03905.
  - 1. Coordinate full scope of concrete slab repair work with Owner's Construction Manager.

F. Verify concrete floors are free of excessive moisture and dusting.

G. Verify that surfaces conform to the manufacturers' requirements for substrate conditions Do not proceed until unsatisfactory conditions are corrected.

### 3.3 GENERAL REQUIREMENTS

A. Complete joint replacement and slab repair work at least 12 hours prior to commencement of any wet polishing.

B. Use sequential progression of diamond pads limited to no more than double the grit value of the previous diamonds used.

C. Allow new concrete slab to achieve its 28 day design strength as documented by Owner' CTL. Approved compressive strength test report from CTL must be received by Owner's Construction Manager prior to allowing densification.

D. Progressively wet diamond polish edges along and around all abutments. Use same progression of polishing segments throughout.

E. Between and after final wet polishing passes, thoroughly scrub and rinse slab surface with clean water and vacuum with auto-scrubber.

### 3.4 SURFACE POLISHING AND DENSIFICATION (EXISTING CONCRETE SLABS)

A. Perform Work where shown on Drawings where existing slab is exposed to Customer view.

B. Progressively wet polish slab surface utilizing approved diamond segments to achieve specified Finish Requirements.

- 1. Perform initial polishing step.
- 2. Overlap adjacent passes by 50%.
- 3. Final polishing pass shall be with no less than 800-grit resin.

C. Apply Reactive Surface Densifier to dry slab surface in accordance with manufacturer's instructions.

- 1. Apply reactive surface densifier after the appropriate polishing pass (typically after 200-grit and before 800-grit). Allow to dry.
- 2. Vary dilution rates per manufacturer's recommendations to eliminate hazing and whitening on slab surface.

D. Burnish:

- 1. Burnish slab with 1500 and 3000-grit Diamond Impregnated Pad to polish slab surface in compliance with specified Finish Requirements.
- 2. Use microfiber pad after burnishing to remove any laitance and debris from slab surface.

E. Apply SR2 stain protectant.

### 3.5 APPAREL FLOOR COLOR STAIN BAND

A. Areas to be treated: Provide stain band or stain band removal and relocation where shown on Drawings at areas of concrete slab exposed to Customers.

B. Open slab surface by progressive wet polishing Steps.

- 1. Perform initial polishing step and all polishing steps utilizing 200 grit and below.
- 2. Install 3M Blue tape to outline 6" band.

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3. Apply application of dye after 200 grit.
4. Apply dye and allow drying.
5. Use a damp microfiber pad to remove any residual dye.
6. Apply densifier after stain application.
7. Continue to perform ongoing progressive polishing steps to complete the Conversion.
8. Burnish with 1500 grit or higher burnishing pad.
9. Apply SR2 stain protectant.

### 3.6 DENSIFICATION (NEW CONCRETE SLABS)

- A. Areas to be treated: Provide Densification where shown on Drawings at all new areas of new concrete slab exposed to Customers.
- B. Open slab surface by wet polishing with resin-bonded or hybrid, phenolic diamond heads.
  1. Perform initial polishing step and all polishing steps utilizing 200-grit and below.
  2. After completion of the above polishing steps, progressively wet polish slab surface.
  3. Overlap adjacent passes by 50%.
  4. Final polishing pass shall be with no less than 800-grit resin.
- C. Apply Stain Protectant.

### 3.7 FINISH REQUIREMENTS:

- A. Appearance: Enhanced interior slabs areas that receive the specified slab enhancement process must consist of the following:
  1. Failure to comply with specifications to produce finish requirements may result in additional cost to Contractor without an increase in Contract time or additional disruption to Store operations.
  2. Slab surface must exhibit a hard polished appearance with no evidence of scratching from grinding/polishing.
    - a. New concrete placed under 03314 and densified as specified herein and existing adjacent slab polished as specified herein shall have matching aesthetics.
  3. White residue, "orange peel" or hazy appearance in the finished surface will not be accepted.
- B. Gloss: Final surface gloss within Sales shall be between 30 and 55 as measured using a Horiba IG-320 Gloss Checker.
- C. Leave work complete and ready for final inspection by Walmart Construction Manager.

### 3.8 FIELD QUALITY CONTROL TESTING

- A. Gloss Measurements:
  1. Gloss shall be considered as a quantitative value that expresses the degree of reflection when light hits the concrete floor surface.
  2. Take gloss measurements independent of ambient lighting and within a sealed measurement window located beneath the testing equipment.
  3. Measure and report as follows:
    - a. Measure gloss values at five evenly but randomly distributed locations within each aisle for each night's work area. Record measurement locations on Floor Phasing Plan.
    - b. If samples fail to meet the specified value, continue burnishing operations until the specified gloss requirements are achieved.
    - c. Collect and certify final gloss measurements to Owner's Construction Manager and the Owner's Independent Concrete Consultant.

### 3.9 CLEANING

- A. Remove spilled, splashed, or splattered finish material from surfaces.

### 3.10 FINAL CLEANING AND PROTECTION BY GENERAL CONTRACTOR

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- A. Protect areas to receive polished concrete finish at all times during construction to prevent oils, dirt, metal, excessive water, paint, and other potentially damaging materials from contacting the finished concrete surface. Initiate the following protective measures immediately after completion of the PFC's work as specified herein.
1. Communicate to Store Manager and all subcontractors, vendors, and trades the importance of maintaining slab protection.
  2. Protect slab surface from moisture for 24 hours.
  3. Each day, inspect equipment used over completed slab surface. Verify the following:
    - a. Equipment is without leaking hydraulic lines and is diapered to avoid staining. Remove all equipment with hydraulic fluid leaks from store site.
    - b. Equipment is without tire embedments (rocks, nails, screws, etc.) that will scratch or pit slab surface.
    - c. Equipment is clean and free of dust prior to start of work requiring equipment.
  4. Do not allow pipe cutting on the finished slab.
  5. Do not place steel on the finished slab to avoid rust staining.
  6. Prevent contact with acids and acidic detergents.
  7. Use breathable drop cloths during all painting. Immediately wipe clean spilled paint.
- B. Damage to finished slab resulting from lack of protection shall be repaired at no additional cost to Owner or Owner's PFC.

END OF SECTION



## SECTION 03531 – ARCHITECTURAL CONCRETE OVERLAYMENT

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
1. Owner furnished and installed hydraulic cement self-leveling concrete overlay and polished concrete floor finish.
  2. Allocation of Owner's Preferred Flooring Contractor and General Contractor responsibilities as described in Part 1 hereafter.
- B. Unless otherwise specified, provisions specified herein for products and execution furnished by Owner are requirements for Owner's Preferred Flooring Contractor and are included herein as information only to General Contractor.
- C. Related Requirements: The following list is intended to aid in locating work related to or dependent on the scope of Work in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
1. Section 02023 - Selective Site Demolition: Existing floor demolition and waste handling.
  2. Section 02320 – Excavating, Backfilling, and Compacting: Trenching, backfill, and preparation by Contractor of trenched slab in customer view areas in preparation for hydraulic cement overlay and polished concrete finish (Remodel).
  3. Section 03363 – Polished Concrete Floor Finishes for Interior Slabs.
  4. Section 03366 – PVC/VCT Removal and Polished Concrete Floor Finishes for Interior Slabs. Polished concrete floor finish for exposed slab when resilient floor tile removal is typically the primary scope for Owner's Preferred Flooring Contractor (Remodel).
  5. Section 03905 - Interior Concrete Slab Repairs and Joint Filler Replacement.
  6. Appendix B – Testing, Inspection and Observation by Owner: Procedures for inspection, testing, and documentation by Owner's Independent Concrete Consultant.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. ASTM International (ASTM):
1. ASTM C 109 – Test Method for Compressive Strength of Hydraulic Cement Mortars.
  2. ASTM C 1708 – Test Methods for Self-Leveling Hydraulic Cement Mortars.
- C. International Concrete Repair Institute (ICRI):
1. No. 03732 - ICRI Surface Profile (CSP) Scale Guideline.
- D. Occupational Safety and Health Administration (OSHA):
1. OSHA 1926.1153 Respirable Crystalline Silica.

## 1.3 OWNER'S PREFERRED FLOORING CONTRACTOR (PFC):

- A. The Owner's Preferred Flooring Contractor is a firm hired by and contracted by the Owner for the purpose of executing work within the scope of this section. The PFC shall be one the following as determined by Owner:
1. Budget Maintenance, Pottstown, PA, (610) 323-7702. Contact: John Jones.
  2. Refuse Materials, Inc., Ocilla, GA, (229) 468-9822. Contact: DA Pope.
  3. Jones Tile, Roach, MO, (573) 346-3862. Contact: Robert Jones.
  4. A and I Floor Covering, Inc., Murray, UT, (801) 509-9587. Contact: Adam DiFabrizio.

## 1.4 PREFERRED FLOORING CONTRACTOR RESPONSIBILITIES

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- A. Provide labor, material, equipment, and services necessary to perform the work in this section.
- B. Conduct work in manner as to minimize disruption of Owner's normal operations.
- C. Coordinate the work included in this Section with floor work assigned to the PFC at other locations of the building.
- D. Administrative and Scheduling Requirements:
  - 1. Coordinate project phasing and relocation of fixtures to ensure minimum interference with other aspects of the Work.
  - 2. Work shall begin no earlier than 15 minutes before approved start time and shall finish within one hour after approved completion time. Coordinate start time and completion time of daily work specified herein with Owner's Construction Manager and Store Manager.
  - 3. Attend morning communication meetings (lead installer).
  - 4. Track material usage and ensure quantities on hand are sufficient for Work.
  - 5. Submit Weekly Flooring Installation Report to Contractor and Walmart Construction Manager each Friday.
  - 6. When necessary or requested, advise General Contractor in phasing and scheduling.
  - 7. Coordinate with Contractor for selecting the staging location for the materials included in the scope of the work.
- E. Existing Materials Management:
  - 1. Move the removed flooring materials from the sales floor to the agreed upon staging area.
  - 2. Slurry Disposal:
    - a. Coordinate scheduling, delivery, and pickup of slurry disposal with waste management and Contractor.
    - b. Pay for slurry disposal.
- F. Return to project site 7-14 days prior to Re-Grand Opening to complete required corrections related to work specified herein.

#### 1.5 CONTRACTOR RESPONSIBILITIES

- A. Prior to submission of bid, determine Owner's designated PFC for project. Coordinate with PFC to evaluate temporary electrical requirements.
- B. Provide temporary electrical service as specified in Section 01500 for PFC's equipment.
- C. Coordinate disconnecting and reconnecting electrical power to existing equipment and fixtures, including registers, which are scheduled to be moved for installation of flooring.
- D. Attend Pre-Possession meeting to advise in development of flooring installation and finishing schedule (Floor Phasing Plan and Schedule).
- E. Slurry Storage Fencing and Monitoring:
  - 1. Provide fencing around slurry bins and any associated storm water BMPs.
  - 2. Unlock slurry fence area during daytime hours for slurry disposal pickup as coordinated with the PFC.
  - 3. Monitor and report incidents on any qualifying spills.
- F. Supervise flooring scope of work, including but not limited to:
  - 1. When necessary or requested, coordinate with and advise CM or PFC in phasing and scheduling.
  - 2. Ensure Phasing Plan schedule is followed (Sequence of moves, daily flooring minimums, etc.).
  - 3. Ensure conformance (quality expectations) with contract documents.
- G. Perform Final Cleaning and Protection as specified in Part 3 herein.

#### 1.6 SUBMITTALS

- A. Product Data Sheets:

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1. High pH Cleaner: Brand name, chemical composition, dilution rate, installation directions and certificates of compliance with required standards, if applicable.
  2. Reactive Surface Densifier, Stain Protector and Colorant Densifier System: Brand name, chemical composition, installation directions and certificates of compliance with required standards.
- B. Manufacturer and model numbers of all equipment to be used (as specified):
1. All polishing machines.
  2. Manufacturer and model of diamond polishing segments. Product data and procedure of polishing must be submitted for verification of compatibility, prior to beginning slab enhancement work.
  3. High speed burnishing equipment, including burnishing pads. Product data for pads must be submitted for verification of pad texture prior to beginning burnishing work.
  4. Scrubber machines.
  5. Concrete slurry waste disposal. Refer to Section 01500.

## 1.7 QUALITY ASSURANCE

- A. Floor Phasing Plan and Schedule: Prior to commencement of work, Store Planning will produce a Floor Phasing Plan and Schedule developed using Owner's most current Drawings (Sheet A1 "Slab Finish Plan").
- B. Floor Phasing Plan and Schedule shall be a detailed program describing the overall intent and agenda of the polishing scope including:
1. Location of all cracks, spalls and other surface defects requiring repairs in accordance with Section 03905. Include quality color digital photographs of sufficient quantity as to illustrate necessary repairs. Images shall be emailed to Owner's Construction Manager and Architect of Record.
  2. Locations of weekly gloss measurements taken in prior scopes.
  3. Concrete slurry waste disposal location.
  4. Unique work requirement locations (i.e. joint repairs, floor patching, etc.).
  5. Scheduling: Include in the Floor Phasing Plan a detailed written schedule for sequence of work which ensures uninterrupted progress of Owner's concurrent operations.
    - a. Include anticipated start and finish date of work.
    - b. Show size, location and anticipated progression of individual nightly work areas, forecasted one week from current date of submission.
  6. Coordinate approval of Floor Phasing Plan and Schedule with Owner's Construction Manager and Store Manager.
- C. Manufacturer's Field Representatives: At the request of Owner's Construction Manager or Owner's Independent Concrete Consultant, manufacturers' technical representatives shall be on site to oversee work specified herein to verify proper use of products and equipment.

## 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Transport, handle, store, and protect products in compliance with the requirements in Division 1 and manufacturer's recommendations.
- B. Deliver materials to site in original, factory sealed, unopened, new containers (drums) bearing manufacturer's name and label intact and legible, with the following information:
1. Name or title of material.
  2. Manufacturer's standard container (drum) numbers.
  3. Application instructions.
- C. Storage:
1. Refer to Section 01500.
  2. Store materials in protected and well-ventilated area at temperatures between 40 and 90 degrees F unless otherwise required by manufacturer. (Provided by General Contractor for use by the PFC).
  3. Keep containers sealed until ready for use.
  4. Do not use materials beyond manufacturer's shelf life limits.

- D. Handling: Protect materials during handling and application to prevent damage or contamination.
  - 1. Dispense penetrating liquid densifier only from factory sealed and numbered containers (drums).
  - 2. Maintain record of container (drum) numbers received and used during floor treatment.

## 1.9 PROJECT CONDITIONS

- A. Before, during and after installation of overlay, maintain building interior temperatures as near as possible to 70 degrees F for 24 hours.

## 1.10 ENVIRONMENTAL REQUIREMENTS

- A. Minimize dust emissions and provide dust suppressing equipment.

## PART 2 - PRODUCTS

- A. Products necessary for and related to the work herein, as well as installation of the concrete overlay system, are furnished by Owner through Owner's Preferred Flooring Contractor (PFC). Owner requirements are located in this Section and not Appendix A for the sake of consolidation and ease for Owner's PFC.
- B. Subject to compliance with project requirements, provide products and equipment by the following:
  - 1. Ameripolish, (800) 592-9320, [www.ameripolish.com](http://www.ameripolish.com).
  - 2. Concrete Polishing Solutions (877) 472-8200 [www.go2cps.com](http://www.go2cps.com)
  - 3. CTS Cement Manufacturing Corp., Garden Grove, CA, (800) 929-3030, [info@ctscement.com](mailto:info@ctscement.com).
  - 4. Husqvarna (800) 288-5040 [www.husqvarna.com](http://www.husqvarna.com)
  - 5. Onyx Environmental Solutions (800) 858-3533 [www.onyxolutions.com](http://www.onyxolutions.com)
  - 6. Pioneer Eclipse (800) 367-3550 [www.pioneer-eclipse.com](http://www.pioneer-eclipse.com)
  - 7. SASE Company, Inc. (800) 522-2606 [www.sasecompany.com](http://www.sasecompany.com)
  - 8. Substrate Technology, Inc. (815) 941-4800 [www.substratetechnology.com](http://www.substratetechnology.com)
  - 9. Superabrasive, Inc., (800) 987-8403, <http://www.superabrasive.com/>
  - 10. Superior Surface Solutions, (888) 471-5227 [www.superiorsurfacesolutions.com](http://www.superiorsurfacesolutions.com).

- C. Substitutions: Comply with the requirements of Section 01600.

## 2.2 EQUIPMENT

- A. Use of Owner's equipment is not allowed.
- B. Auto Scrubber Machines: Equipment used for cleaning operations shall be Clark Encore Max38 or L38 with a head pressure of 150 lbs. or similar equipment as required to achieve the specified Finish Requirements.
- C. Propane Polishing Equipment:
  - 1. Propane polishing machines shall be in full operating condition during the duration of the night's work as required to achieve specified Finish Requirements.
  - 2. Polishers shall have minimum 650 pounds down force.
- D. Diamond Segments:
  - 1. Diamond grinding heads shall be by one of the following manufacturers. Use heads from same manufacturer throughout entirety of project.
    - a. [HTC Professional Floor Systems](http://www.htcprofessional.com).
    - b. [Jon-Don](http://www.jon-don.com).
    - c. [SASE Company, LLC](http://www.sasecompany.com).
    - d. [Substrate Technology, Inc.](http://www.substratetechnology.com)
    - e. [Superabrasive, Inc.](http://www.superabrasive.com)
    - f. [Superior Surface Solutions](http://www.superiorsurfacesolutions.com).
  - 2. Diamond Segment Grit Sizes (or Manufacturer's Equivalent Designations):
    - a. Metal-Bonded Diamonds: 30.
    - b. Ceramic Diamonds: 50,100, and 400.

c. Resin Bonded, Phenolic Diamonds: 1800.

E. High speed propane burnisher: Equipment shall meet the specified minimum performance requirements.

1. Head Size: 21 or 27 inch.
2. Head Weight: 22 pound (40 pound maximum).
3. Engine Size: 585 cc, generating 1,500 RPM or higher (as verified with tachometer).
4. Dust skirt assembly.

F. Burnishing Pads:

1. Diamond Impregnated Pads (DIP): 1500 and 3000 grit.
2. Diamashine Diamond Impregnated Pad by Superior Surface Solutions
3. CASH Diamond Impregnated Pad by Substrate Technology, Inc.
4. Twister Diamond Impregnated Pad

G. Sprayer for Reactive Surface Color Densifier: Carbon dioxide sprayer as follows.

1. Patriot SpraySafe System, by Patriot Sprayer Systems. Provide Red #6 spray tip - 6.4 gallons per hour.

## 2.3 PRODUCTS

A. Joint Filler Products: Polyurea joint filler as specified in Section 03905.

1. Color: Match polished slab surface. Sample installed in mock-up shall be approved by Walmart Construction Manager.

B. Slab Repair Products: Slab repair materials are specified in Section 03905.

C. High pH Cleaner:

1. [Rejuvenating Cleaner](#) by Ameripolish.

D. Reactive Surface Densifier: Hybrid silicate densifier. Clear, abrasion-resistant surface. Colorless, odorless, water-based solution, <50 VOC.

1. [3D HS Densifier](#) by Ameripolish.

E. Concrete Overlay Primer Material: Low odor, two-component, alkali resistant epoxy primer. pH resistant, 0 VOC. Provide the following:

1. [Rapid Set TXP Fast Epoxy Primer](#) by CTS.
2. Primer Broadcast: Clean, #20 or #30 mesh silica sand.

F. Concrete Overlay Material: Hydraulic cement-based, pumpable, self-leveling and fast-drying architectural topping. High density and polishable, tested in accordance with ASTM C 1708. Minimum 5,000 psi strength in accordance with ASTM C 109.

1. Provide [Rapid Set TRU PC Polished Concrete Finish](#) by CTS, Gray 3000.

G. Mix Water for Concrete Overlay: Potable, free of impurities and debris.

2.4 Stain Protector: Clear, abrasion and chemical resistant surface penetrating concrete chemical stain protector, <40 g/l VOC. Do not use water based products.

1. [SR2](#) by Ameripolish.
  - a. Temporary Substitution: Provide [SR2 Plus](#) by Ameripolish as an acceptable substitution for any application of SR2 specified within the scope of this Section if Suppliers indicate SR2 is unavailable.

## 2.5 MIX DESIGN

A. Mix in proportions and methods in accordance with product manufacturer's instructions and recommendations.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine concrete slab with Owner's Construction Manager. Verify that floor is in substantially the same condition as described in the Floor Phasing Plan.
  - 1. Identify and mark additional repair locations not shown in Floor Phasing Plan.

### 3.2 PREPARATION

- A. Close areas to traffic during and after floor finish application for time period recommended by product manufacturer(s).
- B. Cover and protect surrounding surfaces to prevent damage or contamination. Protect surroundings from concrete slurry or debris.
- C. Clean Substrate: Remove existing floor finishes to bare concrete slab.
  - 1. Do not use hazardous materials or flammable, toxic, or solvent-based cleaning products.
  - 2. Remove curing or sealing compounds, paint, and wax.
  - 3. Remove surface contaminants such as oil, grease and general soiling with high pH cleaner/degreaser diluted as recommended by manufacturer using swing machine with red or black pads. Use appropriate pad to achieve desired results while not exposing coarse aggregate or excessive sand within paste layer.
  - 4. Thoroughly rinse floor surface with clean water to remove soap residue and contaminants. Vacuum with auto scrubber.
  - 5. Squeegee dry.
- D. Remove and replace existing deficient joint filler within the limits of required slab polishing and as shown on Drawings, in accordance with Section 03905.
- E. Repair slab defects within the limits of required slab polishing in accordance with Section 03905. Correct previous repairs not conforming to requirements of Section 03905, including any repairs not matching color of adjacent slab surface, in accordance with Section 03905.
  - 1. Coordinate full scope of concrete slab repair work with Owner's Construction Manager.
- F. Verify concrete floors are free of excessive moisture and dusting.
- G. Verify that surfaces conform to the manufacturers' requirements for substrate conditions Do not proceed until unsatisfactory conditions are corrected.

### 3.3 GENERAL REQUIREMENTS

- A. Complete joint replacement and slab repair work at least 12 hours prior to commencement of any wet polishing.
- B. Use sequential progression of diamond pads limited to no more than double the grit value of the previous diamonds used.
- C. Allow new concrete slab to achieve its 28 day design strength as documented by Owner' CTL. Approved compressive strength test report from CTL must be received by Owner's Construction Manager prior to allowing color densification.
- D. Progressively wet diamond polish edges along and around all abutments. Use same progression of polishing segments throughout.
- E. Between and after final wet polishing passes, thoroughly scrub and rinse slab surface with clean water and vacuum with auto-scrubber.
- F. Prime concrete substrate using the primer specified herein or other manufacturer approved primer. Immediately broadcast with sand to rejection. Use HEPA-rated filter equipment to remove loose sand.
  - 1. Verify that primer material sufficiently fills cracks and voids.

### 3.4 APPLICATION

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- A. Do not begin overly application until primer has cured for a minimum of 4 hours.
- B. Place continuously until application is complete. Place material at a minimum thickness of 3/8 inch. Allow a leveling flow time of 15 minutes. Use a gauge rake to spread material and a spiked roller to remove air bubbles as necessary.
- C. Allow 24 hours before polishing.

### 3.5 SURFACE POLISHING AND DENSIFICATION

- A. Progressively wet polish slab surface utilizing approved diamond segments to achieve specified Finish Requirements.
  - 1. Perform initial polishing step using a 30-grit metal-bonded diamond.
  - 2. Complete another polishing pass using a 50-grit ceramic diamond.
  - 3. Apply reactive surface densifier products as specified in Section 03366. Vary dilution rates per manufacturer's recommendations to eliminate hazing and whitening on overlay surface.
  - 4. Complete a third polishing pass using a 100-grit ceramic diamond.
  - 5. Repeat application of densifier.
  - 6. Complete a fourth polishing pass using a 400-grit ceramic diamond.
  - 7. Complete a final polishing pass using an 1800-grit wet resin diamond.
- B. Allow 12 hours before applying stain protectant coatings.
- C. Stain Protectant: Apply [SR2](#) Stain Resistor by Ameripolish using a hog's hair pad.
  - 1. Temporary Substitution: Provide [SR2 Plus](#) by Ameripolish as an acceptable substitution for any application of SR2 specified within the scope of this Section if Suppliers indicate SR2 is unavailable.

### 3.6 FINISH REQUIREMENTS:

- A. Appearance:
  - 1. Provide a polished hydraulic cement overlay surface with no evidence of scratching from grinding/polishing.
  - 2. White residue, "orange peel", or hazy appearance in the finished surface will not be accepted.
- B. Gloss: Final surface gloss approximately 15 as measured using a Horiba IG-320 Gloss Checker.
- C. Failure to comply with specifications to produce finish requirements may result in additional cost to Contractor without an increase in Contract time or additional disruption to Store operations.

### 3.7 OWNER TESTING AND INSPECTION (T&I)

- A. The Owner will perform aesthetic surface and coefficient of friction testing and inspection of the hydraulic cement overlay and polish in Customer Restrooms as specified in Appendix B (Section 03531).
  - 1. Owner's Independent Concrete Consultant will perform tests at the locations shown on the Restroom Floor Testing Locations Plan at Men's and Women's restrooms in both front and rear of store.

### 3.8 FINAL CLEANING AND PROTECTION BY CONTRACTOR

- A. Final cleaning and protection of areas to receive polished concrete overlay are specified in Section 03366. Provide final cleaning and protection in accordance with the requirements in Part 3 of Section 03366.
- B. Protect overlayment from foot traffic for 2 hours. Protect overlayment from normal customer traffic until acceptance by an Owner's representative.

END OF SECTION

## SECTION 03905 – CONCRETE REPAIRS AND JOINT FILLER REPLACEMENT

## PART 1 - GENERAL

## 1.1 SUMMARY

## A. Section Includes:

1. Interior concrete slab repairs for existing ICC and floor surface when required in preparation for existing slab polishing in accordance with Sections 03363 or 03366, including:
  - a. Joint filler removal and replacement.
  - b. Joint edge spall repair.
  - c. Crack repair.
  - d. Surface defect repair, including pop-outs, chips, spalls, and pitting.
  - e. Removal and replacement of previously completed repairs not in compliance with this section.

## B. Related Requirements: The following list is intended to aid in locating work related to or dependent on the scope of Work in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.

1. Section 01330 – Submittal Procedures. Procedures for submittals.
2. Section 01351 - Regulatory Compliance: Waste management and disposal.
3. Section 01500 – Temporary Facilities and Controls. Requirements for control of substances that have the potential for polluting surface and/or groundwater.
4. Section 01700 – Execution Requirements. Requirements for use of fuel powered equipment within the enclosed building.
5. Section 03310 – Structural Concrete and Exterior Concrete Slabs.
6. Section 03363 – Polished Concrete Floor Finishes for Interior Slabs by Owner’s Preferred Flooring Contractor.
7. Section 03366 - PVC/VCT Removal and Polished Concrete Floor Finishes for Interior Slabs by Owner’s Preferred Flooring Contractor.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. Occupational Safety and Health Administration (OSHA):
  1. OSHA 01926.1153 Respirable Crystalline Silica.

## 1.3 ENVIRONMENTAL REQUIREMENTS

- A. Minimize dust emissions and provide equipment that suppresses dust.
- B. Dispose of construction waste in accordance with the Contract requirements referenced in Section 01351 Regulatory Compliance.

## 1.4 SUBMITTALS

- A. Within 21 days after award of prime contract, submit in accordance with procedures specified in Section 01330. Unless otherwise specified herein, send submittals to Architect of Record as specified in Section 01330.
  1. Submit all submittal items required within this section and Section 03363 in a single submittal via e-mail (maximum document size 10 Mb).
    - a. Do not submit submittals of this section together with submittals in any other section.
  2. If Contractor fails to submit a complete Concrete Slab Enhancement Submittal Package within 21 days after award of prime contract, the Contractor shall pay the Owner \$250.00 per day as liquidated damages and not



- as a penalty, until the fully completed Concrete Slab Enhancement submittal package is received by the Architect of Record.
3. Submittals shall be complete, accurate, and in full compliance with contract requirements for proper and timely approval.
  4. Maintain one copy of approved documents on site.
  5. Identify submittals explicitly in accordance with Section 01330.
  6. Fill out and submit attached Concrete Slab Repair and Joint Filler Replacement Submittal Form attached at the end of this Section.

B. Submittal Rejections:

1. Submittals which do not comply with Contract Documents will be rejected. If submittal is rejected for any reason, Owner will back-charge the Contractor \$200.00 via Change Order, to cover the processing costs of each subsequent review until submittal is approved. Reasons for submittal rejections include, but are not limited to, the following:
  - a. Incomplete Concrete Slab Enhancement Submittal Package.
  - b. Lack of required certifications.
  - c. Unspecified equipment.
  - d. Unspecified products.
2. Rejected submittals shall be revised and resubmitted until approved. Extension of Contract time will not be allowed for rejected submittals.
  - a. The Contractor shall revise and resubmit rejected submittals within 7 days of receipt of rejected submittals.
  - b. The Contractor shall verify that the Slab Enhancement subcontractor has addressed all required revisions in the re-submittal.

C. Product data and Material Safety Data Sheets (MSDS):

1. All products and primary equipment used for repair of existing concrete slab defects.

D. Joint Filler and Slab Repair Subcontractor Requirements:

1. Joint Filler and Slab Repair Subcontractor Qualifications: Provide to General Contractor for submittal a list of minimum of 5 projects performed within the last 2 years of similar type, size and complexity as this contract. Provide project names, addresses, contact names, phone numbers, and scope of work for each project at time of Bid and within Slab Enhancement Submittal Package.
2. Joint Filler and Slab Repair Subcontractor shall be a contractor possessing current certifications at time of Bid.
  - a. Joint filler installation and slab repair shall be performed by same subcontractor.
  - b. Joint filler and slab repair subcontractor personnel shall remain the same throughout the completion of specified work unless approved in writing by Wal-Mart.
  - c. Joint Filler and Slab Repair Subcontractor shall not sub-subcontract any work in this Section.
3. Joint Filler and Slab Repair Subcontractor Certifications: Provide to General Contractor for submittal a letter of certification, identifying individuals that are currently certified installers of the following specified materials and are familiar with proper procedures and installation methods as required by the specified product manufacturers.
  - a. Polyurea Joint Filler.
  - b. Low Viscosity Rigid Urethane.

## 1.5 QUALITY ASSURANCE

A. Environmental Requirements:

1. Comply with the Contract requirements referenced in Section 01351 for construction and demolition waste management and disposal.
2. Comply with current Federal, state and local air quality regulations and with Federal requirements on concrete silica dust emissions. Do not dry grind or polish slab surface.
3. Limit and control all noise and damage from excessive dust caused by demolition, preparation, and installation of specified work.
4. Limit and control damage from moisture.

5. Refer to Section 01500 for control of substances that have the potential for polluting surface and/or ground-water.
6. All replaced concrete shall be cured a minimum of 28 days prior to joint filler installation.
7. Close finished slab area to traffic during application and after application for a time as recommended by manufacturer.
8. Upon completion of densifier application, dispose of excess materials.

#### 1.6 CONTRACTOR RESPONSIBILITIES – INTERIOR SLAB SURFACE ENHANCEMENT

- A. Provide temporary electrical service for floor equipment as specified in Section 01500.
- B. Coordinate disconnecting and reconnecting electrical power to existing equipment and fixtures which are scheduled to be moved for installation of flooring.
- C. Attend Pre-Possession meeting to advise in development of flooring installation and finishing schedule (Floor Phasing Plan and Schedule).
- D. Coordinate slurry storage fencing and monitoring as required herein.

#### 1.7 DELIVERY, STORAGE, AND HANDLING – INTERIOR SLAB SURFACE ENHANCEMENT

- A. Transport, handle, store, and protect products in compliance with the requirements in Division 1 and manufacturer's recommendations.
- B. Deliver materials to site in original, factory sealed, unopened, new containers (drums) bearing manufacturer's name and label intact and legible, with the following information:
  1. Name or title of material.
  2. Manufacturer's standard container (drum) numbers.
  3. Application instructions.
- C. Storage:
  1. Refer to Section 01500.
  2. Store materials in protected and well-ventilated area at temperatures between 40 and 90 degrees F unless otherwise required by manufacturer.
  3. Keep containers sealed until ready for use.
  4. Do not use materials beyond manufacturer's shelf life limits.
- D. Handling: Protect materials during handling and application to prevent damage or contamination.
  1. Dispense penetrating liquid densifier only from factory sealed and numbered containers (drums).
  2. Maintain record of container (drum) numbers received and used during floor treatment.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS – INTERIOR SLAB SURFACE ENHANCEMENT

- A. Subject to compliance with project requirements, provide products and equipment by the following:
  1. Ameripolish, (800) 592-9320, [www.ameripolish.com](http://www.ameripolish.com).
  2. Concrete Polishing Solutions (877) 472-8200 [www.go2cps.com](http://www.go2cps.com)
  3. Husqvarna (800) 288-5040 [www.husqvarna.com](http://www.husqvarna.com)
  4. Onyx Environmental Solutions (800) 858-3533 [www.onyxolutions.com](http://www.onyxolutions.com)
  5. Pioneer Eclipse (800) 367-3550 [www.pioneer-eclipse.com](http://www.pioneer-eclipse.com)
  6. SASE Company, Inc. (800) 522-2606 [www.sasecompany.com](http://www.sasecompany.com)
  7. Substrate Technology, Inc. (815) 941-4800 [www.substratetechnology.com](http://www.substratetechnology.com)
  8. Superabrasive, Inc., (800) 987-8403, <http://www.superabrasive.com/>
  9. Superior Surface Solutions, (888) 471-5227 [www.superiorsurfacesolutions.com](http://www.superiorsurfacesolutions.com)]
- B. Substitutions: Comply with the requirements of Section 01600.

## 2.2 PRODUCTS – INTERIOR SLAB SURFACE ENHANCEMENT

- A. Joint Filler Products: Polyurea joint filler as specified herein.
  - 1. Color: Match polished slab surface. Sample installed in mock-up shall be approved by Owner's Construction Manager.
- B. Slab Repair Products: Interior Concrete Slab Repair materials are specified herein.
- C. High pH Cleaner:
  - 1. [Rejuvenating Cleaner](#) by Ameripolish.
- D. Reactive Surface Densifier: Hybrid silicate densifier. Clear, abrasion-resistant surface. Colorless, odorless, water-based solution, <50 VOC.
  - 1. [3D HS Densifier](#) by Ameripolish.
- E. Stain Protector: Clear, abrasion and chemical resistant surface penetrating concrete chemical stain protector, <40 g/l VOC. Do not use water based products.
  - 1. [SR2](#) by Ameripolish.
    - a. Temporary Substitution: Provide [SR2 Plus](#) by Ameripolish as an acceptable substitution for any application of SR2 specified within the scope of this Section if Suppliers indicate SR2 is unavailable.

## 2.3 EQUIPMENT – INTERIOR SLAB SURFACE ENHANCEMENT

- A. Auto Scrubber Machines: Equipment used for cleaning operations shall be Clark Encore Max38 or L38 with a head pressure of 150 lbs. or similar equipment as required to achieve the specified Finish Requirements.
- B. Propane Polishing Equipment:
  - 1. Propane polishing machines shall be in full operating condition during the duration of the night's work as required to achieve specified Finish Requirements.
  - 2. Polishers shall have minimum 650 pounds down force.
- C. Diamond Segments:
  - 1. Diamond grinding heads shall be by one of the following manufacturers. Use heads from same manufacturer throughout entirety of project.
    - a. HTC.
    - b. John Don
    - c. SASE, Inc.
    - d. Substrate Technology, Inc.
    - e. Superabrasive, Inc.
    - f. Superior Surface Solutions.
  - 2. Diamond Segment Grit Sizes (or Manufacturer's Equivalent Designations):
    - a. Metal bonded diamonds: 40, 60, 80, 150
    - b. Hybrid Style Diamonds: 80,100, 120 and 200
    - c. Resin Bonded, Phenolic Diamonds: Progression of all polishing steps shall include sequential grit sizes that are not greater than twice the previous grit used.
- D. High speed propane burnisher: Equipment shall meet the specified minimum performance requirements.
  - 1. Head Size: 21 or 27 inch.
  - 2. Head Weight: 22 pound (40 pound maximum).
  - 3. Engine Size: 585 cc, generating 1,500 RPM or higher (as verified with tachometer).
  - 4. Dust skirt assembly.
- E. Burnishing Pads:
  - 1. Diamond Impregnated Pads (DIP): 1500 and 3000 grit.
  - 2. Diamashine Diamond Impregnated Pad by Superior Surface Solutions
  - 3. CASH Diamond Impregnated Pad by Substrate Technology, Inc.
  - 4. Twister Diamond Impregnated Pad

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- F. Sprayer for Reactive Surface Densifier: Carbon dioxide sprayer as follows.
  - 1. Patriot SpraySafe System, by Patriot Sprayer Systems. Provide Red #6 spray tip - 6.4 gallons per hour.
- G. Slurry Storage Fencing:
  - 1. Provide fencing around slurry bins and any associated storm water BMPs.

#### 2.4 MANUFACTURERS AND PRODUCTS – INTERIOR AND EXTERIOR CONCRETE SLAB REPAIRS

- A. Subject to compliance with project requirements, provide floor slab repair products as manufactured by the following:
  - 1. Advanced Blending (817) 477-8022 [www.advancedblending.com](http://www.advancedblending.com)
  - 2. Ardex Engineered Concrete, Aliquippa, PA (888) 512-7339. Contact: Linda Zigman, (312) 218-6893.
  - 3. Brulin & Company (800) 776-7941 [www.brulin.com](http://www.brulin.com)
  - 4. Hi-Tech Structural Epoxy Systems (800) 454-5530 [www.hitechpolyurea.com](http://www.hitechpolyurea.com)
  - 5. Metzger/McGuire (800) 223-6680 [www.metzgermcguire.com](http://www.metzgermcguire.com)
  - 6. Prime Resins, (800) 321-7212 [www.primeresins.com](http://www.primeresins.com)
  - 7. Prosoco (866) 363-4567, [prosoco.com](http://prosoco.com).
  - 8. Roadware, Inc. (800) 522-7623 [concretemender.com](http://concretemender.com).
  - 9. SpecChem (866) 791-8700, [specchem.com](http://specchem.com). Contact Mike LeMark, [mlemark@specchem.com](mailto:mlemark@specchem.com), (913) 713-2242.
  - 10. Superior Surface Solutions (888) 471-5227 [www.superiorsurfacesolutions.com](http://www.superiorsurfacesolutions.com)
  - 11. VersaFlex, Inc. (913) 321-1416 [www.versaflex.com](http://www.versaflex.com)
- B. Polyurea Joint Filler: Rapid setting, two-component polyurea polymer liquid of 100% solids content, Shore hardness 85-90, compatible with construction materials in contact.
  - 1. HT-PE85, High-Tech.
  - 2. EP 80, by Metzger/McGuire.
  - 3. VersaFlex SL/85, by VersaFlex.
  - 4. Match color of adjacent exposed concrete slab surface.
- C. Structural Urethane (low viscosity):
  - 1. 10 Minute Concrete Mender, by Roadware
  - 2. Spall TX, by High Tech
  - 3. Rapid ReFloor, by Metzger/McGuire.
  - 4. Quick Mender, by VersaFlex.
  - 5. Match color of adjacent exposed concrete slab surface.
- D. Silica Sand
  - 1. Dry 00 Sandblasting sand.
- E. Structural Mortar
  - 1. Armor-Hard Extreme, by Metzger/McGuire.
  - 2. Dimakrete Polish Mortar, by Superior Surface Solutions.
  - 3. RepCon 928, by SpecChem.
- F. Surface Pitting Grout
  - 1. Dimakrete Polish Grout, by Superior Surface Solutions.
  - 2. Quick MenderX.O., by VersaFlex.
  - 3. Rapid ReFloor Pit Grout, by Metzger/McGuire.
  - 4. Approved equal.
- G. High pH Cleaner:
  - 1. Amodet Degreaser/Cleaner by Advanced Blending.
  - 2. Brulin Deep Scrub Cleaner by Brulin & Co.
  - 3. Cleaner/Degreaser by Prosoco.
  - 4. Equivalent approved products.

## 2.5 EQUIPMENT – INTERIOR AND EXTERIOR CONCRETE SLAB REPAIRS

- A. Refer to Section 01700 for requirements related to acceptable power sources specified herein.
- B. Subject to compliance with project requirements, provide floor slab repair equipment manufactured by the following:
  - 1. Gator Finishing Products (800) 2554748, [www.gatorfinishing.com](http://www.gatorfinishing.com)
  - 2. HTC (877) 482-8700, [www.htc-america.com](http://www.htc-america.com)
  - 3. Joe Due Blades and Equipment, Mauston, WI, (877) 563-3833.
  - 4. Norton Abrasives (800) 331-3604, [www.nortonabrasives.com](http://www.nortonabrasives.com)
  - 5. Pulman-Ermator (800) 232-2635, [www.pullman-ermator.com](http://www.pullman-ermator.com)
  - 6. SASE Company, Inc., Kent, WA (800) 522-2606
  - 7. U.S. Saws, Santa Ana, CA (866) 987-7297.
  - 8. [OBHC, Inc. dba Gorilla Concrete Tools](#), Columbia Station, OH, (440) 236-5112.
- C. Dust Collection Vacuum System: Connect one of the following dust collection systems directly to each tool. Verify that collection system provided is equipped with HEPA-rated filter and is recommended by the manufacturer to maintain dust emissions below the permissible level. Verify air flow speed is acceptable for the size of the blade.
  - 1. 26D, by HTC.
  - 2. S2400, by Pullman-Ermator.
  - 3. Bull 50, by SASE Company, Inc.
  - 4. Similar equipment as required to produce the specified results.
- D. Floor Slab Joint Filler Removal and Preparation
  - 1. Humpback Cutter Complete, by Joe Due.
  - 2. Dust Buggy, by U.S. Saws.
  - 3. [Gorilla Concrete Tools](#) GCT-10 or GCT-9 Silverback by OBHC, Inc.
  - 4. Similar equipment as required to produce the specified results.
- E. Floor Slab Crack Repair:
  - 1. 5” Dust Mizer 005, by Joe Due.
  - 2. 7” Dust Mizer 007, by Joe Due.
  - 3. Crack Attacker, by Joe Due.
  - 4. 7” Handheld Crack Chaser, by Joe Due.
  - 5. SawTec 5” Tile Vac, by U.S. Saws.
  - 6. SawTec 7” Crac-Vac, by U.S.Saws.
  - 7. Similar equipment as required to produce the specified results.
- F. Floor Surface Grinder: Handheld 5”-7” electric surface grinder with dustless shroud/housing.
  - 1. Dust Avenger 5, by Joe Due.
  - 2. Dust Avenger 7, by Joe Due.
  - 3. SawTec 5” Grinder Vac, by U.S. Saws.
  - 4. SawTec 7” Grinder Vac, by U.S. Saws.
  - 5. Similar equipment as required to produce the specified results.
- G. Floor Slab Fiber Stripping Pads
  - 1. Rapid Strip Disc, by Norton
  - 2. Gator Fiber Disc, by Gator Finishing Products
  - 3. Similar equipment as required to produce the specified results.

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Concrete rehabilitation work specified in this Section shall be in accordance with the locations and limitations shown on Drawings.

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- B. Installation of specified products shall be in accordance with product manufacturer's written instructions.
- C. Verify that sawing and grinding tools are equipped with a dust collection system as specified herein.
- D. For repairs of this Section requiring clean joints of loose concrete, joint filler, laitance, dust, and debris, use a HEPA-rated filter vacuum.

### 3.2 EXAMINATION – INTERIOR FLOOR SLAB REPAIRS

- A. An evaluation of the existing floor slab shall be conducted, identifying all defects. Scope of repairs shall be confirmed by the Owner's Concrete Consultant prior to commencement of work. Identify scope of work on Floor Polishing Plan specified in other section(s) of Division 3 – Concrete.

### 3.3 PREPARATION – INTERIOR FLOOR SLAB REPAIRS

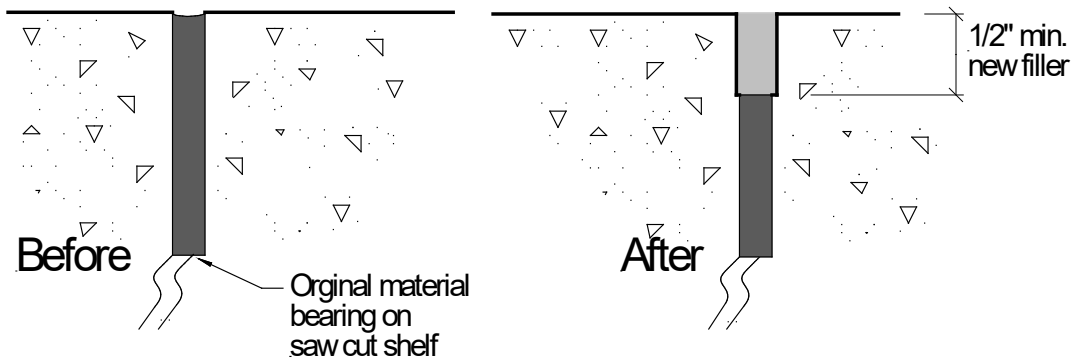
- A. Close areas to traffic during and after floor finish application for time period recommended by product manufacturer(s).
- B. Cover and protect merchandise and racking to prevent damage or contamination of stored products. Provide dust drapes as required to protect merchandise from dust or debris.
- C. Protect surface of slab immediately adjacent to defect under repair.
- D. Do not proceed until Owner's Construction Manager has approved repair material match.

### 3.4 INTERIOR FLOOR SLAB SURFACE ENHANCEMENT

- A. Slurry Storage Monitoring:
  1. Unlock slurry fence area during daytime hours for slurry disposal pickup.
  2. Monitor and report incidents on any qualifying spills.
- B. Clean Substrate: Remove existing floor finishes to bare concrete slab.
  1. Do not use hazardous materials or flammable, toxic, or solvent-based cleaning products.
  2. Remove curing or sealing compounds, paint, and wax.
  3. Remove surface contaminants such as oil, grease and general soiling with high pH cleaner/degreaser diluted as recommended by manufacturer using swing machine with red or black pads. Use appropriate pad to achieve desired results while not exposing coarse aggregate or excessive sand within paste layer.
  4. Thoroughly rinse floor surface with clean water to remove soap residue and contaminants. Vacuum with auto scrubber.
  5. Squeegee dry.
- C. Remove and replace existing deficient joint filler within the limits of required slab polishing and as shown on Drawings, in accordance with the requirements herein.
- D. Repair slab defects within the limits of required slab polishing in accordance with the requirements herein. Correct previous repairs not conforming to requirements herein, including any repairs not matching adjacent slab surface, in accordance with the requirements herein.
  1. Coordinate full scope of concrete slab repair work with Owner's Construction Manager.
- E. Verify floors are free of excessive moisture and dusting.
- F. Verify that surfaces conform to the manufacturers' requirements for substrate conditions. Do not proceed until unsatisfactory conditions are corrected.
- G. Complete joint replacement and slab repair work at least 12 hours prior to commencement of any wet polishing.

- H. Use sequential progression of diamond pads limited to no more than double the grit value of the previous diamonds used.
- I. Between and after final wet polishing passes, thoroughly scrub and rinse slab surface with clean water and vacuum with auto-scrubber.
- J. Surface Polishing And Densification (Existing Concrete Slabs)
  - 1. Perform Work where shown on Drawings where existing slab is exposed to Customer view.
  - 2. Progressively wet polish slab surface utilizing approved diamond segments to achieve specified Finish Requirements.
    - a. Perform initial polishing step.
    - b. Overlap adjacent passes by 50%.
    - c. Final polishing pass shall be with no less than 800-grit resin.
  - 3. Apply Reactive Surface Densifier to dry slab surface in accordance with manufacturer's instructions.
    - a. Apply reactive surface densifier after the appropriate polishing pass (typically after 200-grit and before 800-grit). Allow to dry.
    - b. Vary dilution rates per manufacturer's recommendations to eliminate hazing and whitening on slab surface.
  - 4. Burnish:
    - a. Burnish slab with 1500 and 3000-grit Diamond Impregnated Pad to polish slab surface in compliance with specified Finish Requirements.
    - b. Use microfiber pad after burnishing to remove any laitance and debris from slab surface.
  - 5. Apply SR2 stain protectant.
- K. Finish Requirements:
  - 1. Appearance: Enhanced interior slabs areas that receive the specified slab enhancement process must consist of the following:
    - a. Failure to comply with specifications to produce finish requirements may result in additional cost to Contractor without an increase in Contract time or additional disruption to Store operations.
    - b. Slab surface must exhibit a hard polished appearance with no evidence of scratching from grinding/polishing.
    - c. White residue, "orange peel" or hazy appearance in the finished surface will not be accepted.
  - 2. Gloss: Final surface gloss within Sales shall be between 30 and 55 as measured using a Horiba IG-320 Gloss Checker.
  - 3. Leave work complete and ready for final inspection by Walmart Construction Manager.
- L. Cleaning:
  - 1. Remove spilled, splashed, or splattered finish material from surfaces.

3.5 JOINT MILLING AND CAP FILLER REPLACEMENT

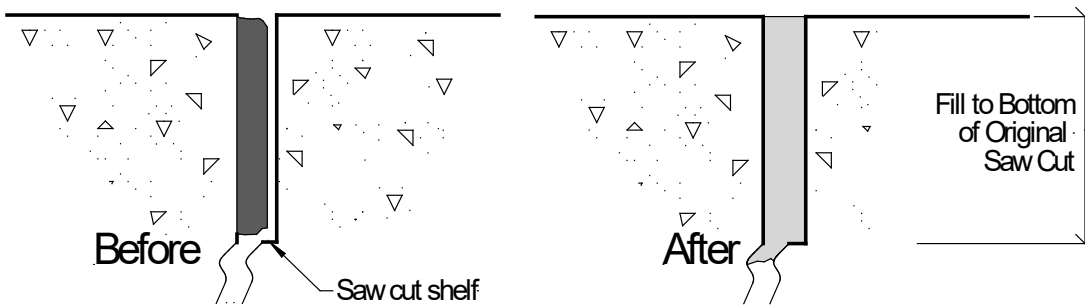


A. If existing joint filler is sound and resting on top of saw cut shelf,

mill top 1/2" of material and refill with specified polyurea joint filler:

- B. Re-saw the joint to a minimum depth of 1/2" with a dry-cut, vacuum-equipped saw using a slightly oversized blade. The blade width should be sufficient to encapsulate the widest spall along a given contraction joint segment to produce a sharp corner on each side of the joint with a minimum of two passes through the joint.
- C. Refill with polyurea joint filler material from the bottom up, taking care not to entrap large air bubbles per manufacturer's recommendation. Slightly overfill and shave flush to the surface, prior to grinding process.
- D. Ensure that after grinding, the joint is cut smooth and flush with the finish floor surface, without concave or intermittent, darkened profile.

### 3.6 FULL DEPTH JOINT FILLER REPLACEMENT

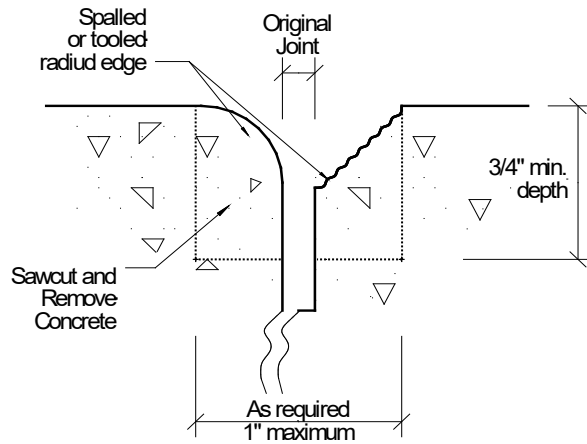


Note: if shelf width at base of saw cut is less than 1/4" on either side of joint, minimum required filler depth is 2" placed over compressible backer rod or bagged silica sand.

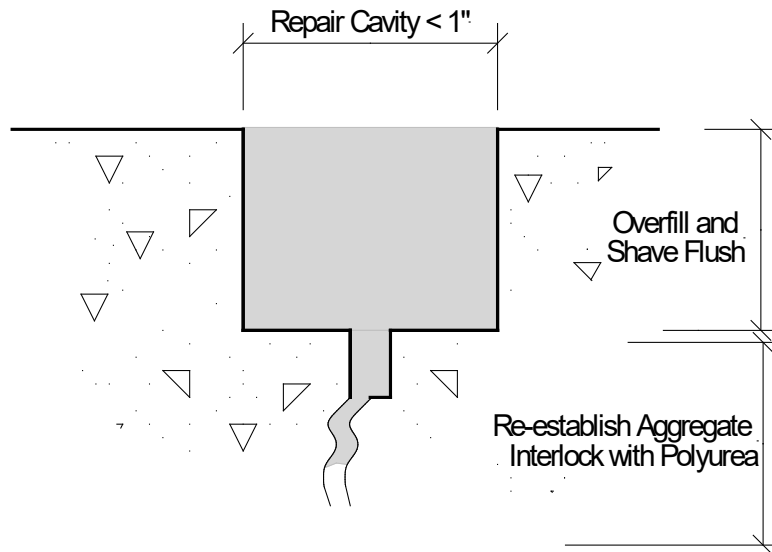
- A. If existing joint filler is loose, easily removed, or able to be forced downward with a hand tool, remove all filler material from joint and refill.
- B. Re-saw joint full depth with a dry-cut, vacuum-equipped saw using a slightly oversized blade. The blade width should be sufficient to encapsulate the widest spall along a given contraction joint segment to produce a sharp corner on each side of the joint with a minimum of two passes through the joint. Remove all filler material, debris, and laitance.
- C. If shelf width at base of saw cut is less than 1/4 inch on either side of joint, fill joint with compressible backer rod to not more than 2 inches below slab surface.
- D. Refill with polyurea joint filler material from the bottom up, taking care not to entrap large air bubbles per manufacturer's recommendation. Slightly overfill and shave flush to the surface prior to grinding process.
- E. Ensure that after grinding, the joint is cut smooth and flush with the finish floor surface, without concave or intermittent, darkened profile.



3.7 CONTROL JOINT REPAIR (LESS THAN 1")



- A. For joints that are spalled or have radius tooled edges not exceeding 1" in width at slab surface.
- B. Re-saw the joint edge to a minimum depth of 3/4" with a dry-cut, vacuum-equipped saw allowing removal of the widest spall (or top of radius) along a given joint segment to produce a sharp corner on each side of the joint with a minimum of two passes through joint.
- C. Clean joint of loose concrete, joint filler, laitance, dirt, debris, backer rod, etc.
- D. Joints must be free of all visible moisture.
- E. Ensure filler penetrates the irregular aggregate interlock portion of the sawn contraction joint as shown below, re-establishing the aggregate interlock that may have been lost due to shrinkage, curling, and lack of reinforcement.

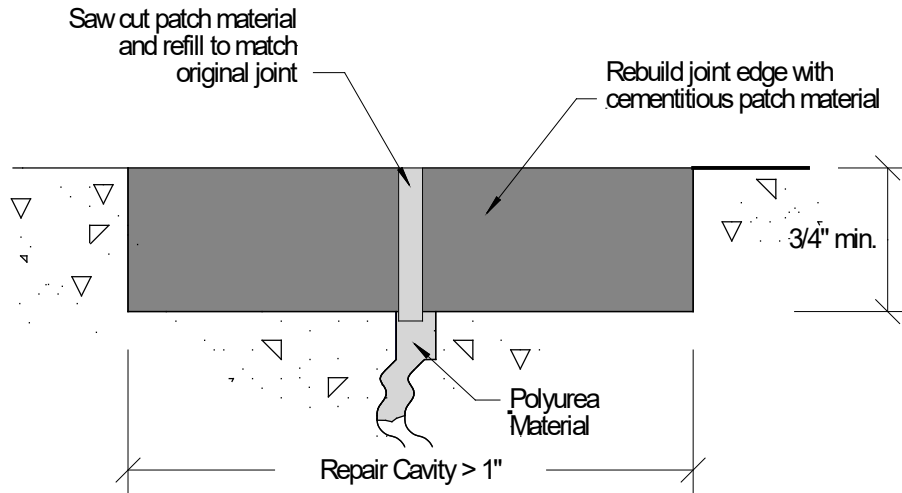


- F. Gravity feed a trace amount (1/8") of silica sand into joint to prevent 3-sided bonding of joint filler. Use proper dust control methods in handling silica sand.

- G. Fill joint cavity per manufacturer's instructions, taking care not to entrap large air bubbles. Overfill joint slightly and shave flush to slab surface prior to grinding process.

### 3.8 CONTROL JOINT REPAIR (GREATER THAN 1")

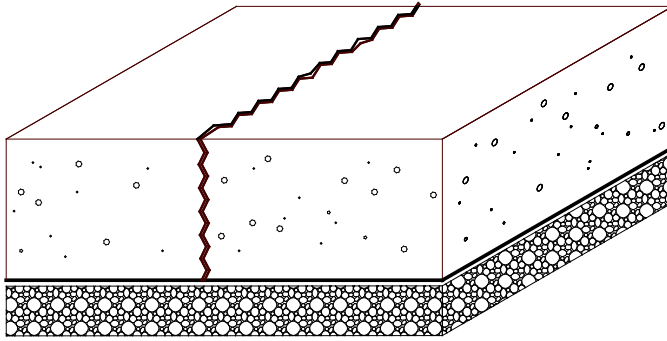
- A. For control joints that exceed 1" in width at slab surface or where the slab displays height differential greater than



1/4" at either side of joint.

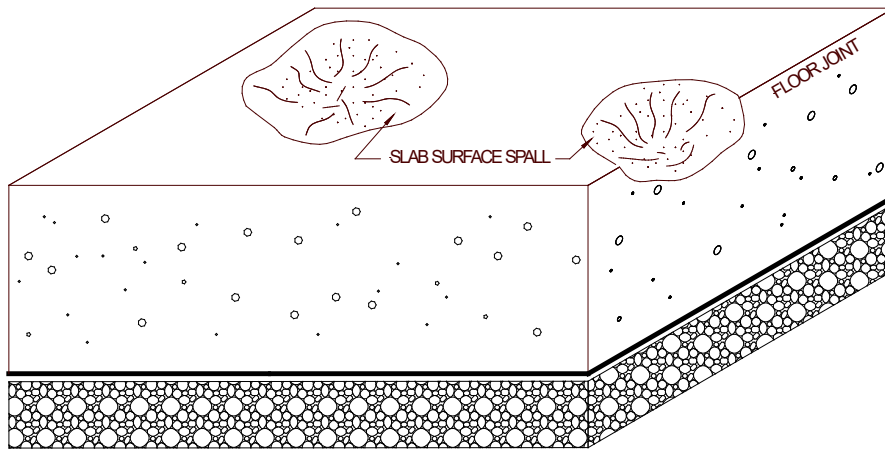
- B. Re-saw the control joint edge to a minimum depth of 3/4" with a dry-cut, vacuum-equipped saw allowing removal of the widest spall along a given joint segment to produce a sharp corner on each side of the joint with a minimum of two passes through joint. Maintain consistent width of repair to within 1/2 inch in 10 feet.
  - 1. For construction joints experiencing 1/4" or greater height differential at abutting joint edges, repair material should slope at 1/4" per foot at floor surface.
- C. Acceptable Patch Materials
  - 1. Structural Mortar installed in accordance with manufacturer's recommendations.
  - 2. Sand Modified Structural Urethane:
    - a. Place 1/2" layers of dry Silica Sand in bottom of spalled cavity.
    - b. Pour structural urethane material over sand until sand is slightly covered.
    - c. Repeat 1/2" blended layers of sand and structural urethane material until slightly overfilled above finished concrete surface.
- D. Allow patch material to dry (drying time will vary based on temperature).
- E. Overfill repair cavity with patch material per manufacturer's instructions and grind flush to slab surface.
- F. Use hand grinder with Fiber Stripping Pad to hone over -fill level to adjacent slab surface.
- G. After patch material has cured, and prior to any traffic on patched surface, re-saw original slab joint(s) and fill with polyurea joint filler per manufacturer's instructions.
- H. Polish or burnish repair material to match adjacent slab surface after material has properly cured.

### 3.9 CRACK REPAIR



- A. Crack width less than 1/32" without surface spalling.
  - 1. Do not repair.
  
- B. Cracks from 1/32" to 3/8" in width.
  - 1. Clean crack cavity.
    - a. Remove loose concrete, dirt and debris from crack with a wire brush or hand grinder with twisted wire wheel attachment, 1/2" minimum depth, insuring crack sidewall is clean.
    - b. Remove any loose segments, including islands formed by crack, with sharp tool.
    - c. Use methods that will not widen existing crack.
    - d. Vacuum crack to remove all dirt, debris and other laitance.
  - 2. Mask slab surface along crack as necessary to minimize overfill.
  - 3. Choose material color that closely matches the adjacent floor.
  - 4. Install low viscosity rigid urethane repair material in accordance with manufacturer's instructions.
  - 5. Repeat until all voids are filled and material crowns slab surface.
    - a. Do not flood area around crack.
    - b. Watch for bubble formation and out gassing.
    - c. Do not allow material to gel before adding additional material.
  - 6. Shave or grind material flush to surface as stipulated by manufacturer.
  
- C. Cracks from 3/8" to 1" in width
  - 1. Saw top or edge of crack to provide square edge, minimum 3/4" in depth.
    - a. Use small hand grinder with maximum 5" diameter blade, minimizing eventual crack width while maintaining uniformity of shape.
  - 2. Clean crack cavity.
    - a. Vacuum crack to remove all dirt, debris and other laitance.
    - b. Remove all visible moisture.
  - 3. Mask slab surface along crack as necessary to minimize overfill.
  - 4. Install polyurea joint filler.
    - a. Dispense sample into small bucket to test blending of material.
    - b. Prime crack with repair material.
    - c. Dispense material, dragging dispenser tip along crack, until it flows over the slab.
  - 5. Wait approximately 10 minutes, periodically checking for material cure.
    - a. Check condition of material by shaving with razor scraper.
    - b. Material will shave smooth when cured.
    - c. Proper timing is crucial.
      - 1) Too long and material will be difficult to shave.
      - 2) Too soon and material will ravel.
  - 6. Shave material flush to slab surface per manufacturer's instructions.

### 3.10 SURFACE SPALLING REPAIR



- A. Route edge of spall to provide 1/2" deep square edge.
  1. Use small hand grinder with maximum 5" diameter dry diamond blade and vacuum system attachment.
  2. Do not overcut slots into existing slab surface.
- B. Clean and prep spalled cavity.
  1. Wire brush spalled surface to remove all dirt and laitance.
  2. Mask slab at perimeter of spall with tape.
- C. Install low viscosity rigid urethane repair material using tube cartridge without flow restrictor.
- D. Polish over repair area with diamond disks to blend surface.
  1. Feather filler material into the adjacent concrete floor surface.
  2. With 2000 grit disk and firm pressure, add a few burn marks to mottle surface to blend with adjacent floor surface.
- E. NOTE: For spalled joints, a form material may be needed to temporarily support vertical face of spalled joint edge. Ensure that the repair material will not adhere to the form.

### 3.11 BOLT HOLE/SPALL REPAIR

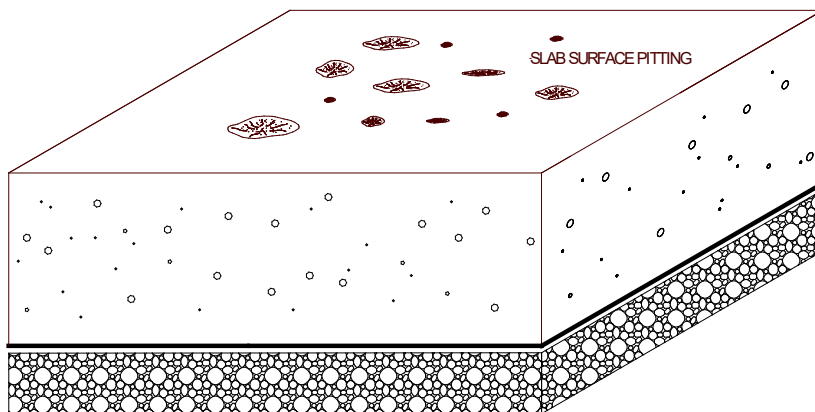
- A. Recess steel bolt a minimum of 1/2" below finish floor by either punching or cutting.
- B. For spall fracture edge less than 30 degrees, square edge to a minimum 3/8" depth with either a drill bit or chisel.
- C. For surface spalls resulting from removal of transition strips, use hollow core drill bit to remove surrounding concrete spall to nominal depth of 1/2". Adjacent repairs shall be of a consistent diameter (max repair size 1" nominal).
- D. Clean cavity of all debris and laitance with drill activated, brass wire wheel. Vacuum hole to remove all dirt, debris and other laitance.
- E. Dispense low viscosity rigid urethane at moderate pace using steady pressure. Dispense material into void, refilling as necessary to produce slight crown.
- F. Grind material flush to slab surface per manufacturer's instructions.

### 3.12 LARGE SURFACE REPAIR

- A. Edge perimeter with diamond masonry wheel to produce sharp edge, at least 3/8" deep.
- B. Roughen base surface and vacuum clean. Wire brush to remove any small loose material and vacuum again.

- C. Protect adjacent slab surface with tape at perimeter of repair area, width as required to prevent scratching during troweling operations.
- D. Mist floor surface until damp but without standing water.
- E. Prepare slurry prime coat of polymerized Portland cement compound and scrub into repair surface with stiff bristle brush. Do not allow to dry before placing pigmented repair material. Use of concrete bonding agent optional.
- F. Mix repair material in accordance with manufacturer's instructions.
- G. Place repair material in floor surface defect and float level. Use float on edge as using flat will cause material to stick and pull.
- H. Lightly mist floated repair material with the finishing aid once and perform first troweling pass to smooth surface without over-working; do not reapply finishing aid during any other troweling operations.
- I. Wait until material begins to set and can be indented with finger about 1/8" and perform second troweling pass, approximately two hours after initial placement.
- J. Using a fine sharp edged cutting tool, cut along edge of repair material and adjacent slab to prevent raveling of edge during tape removal, or remove tape earlier before material has set up all the way to prevent raveling or spalling.
- K. When material has become stiff and can be slightly indented with hard finger pressure, final trowel using firm pressure until mottling and a shine has become apparent. Surface should be tight, level and smooth without surface defects. Do not allow trowels to be positioned on surface flat, as surface will tear. Use circular sweeping motions. Final set should be around 4-5 hrs from time of placement.
- L. Keep surface clean during troweling operations to prevent any laitance from coming in contact with the repair material and marring surface.
- M. Check material set after 30 minutes to 1 hour. Surface should not dent with fingernail under hard hand pressure.
- N. Dye and polish or burnish repair material to match adjacent slab surface after material has properly cured.
- O. Remove tape and clean area of all particles on repair surface and adjacent floor surface.
- P. Re-establish original concrete slab joints by sawing completely through patch and re-filling with polyurea joint filler prior to exposure to traffic.

### 3.13 SURFACE PITTING REPAIR



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- A. This repair is to be used in areas where the number of minimum 1/4" size diameter slab pits exceeds eight per square foot.
- B. Using high pH cleaner, scrub slab surface using swing machine with stiff brush, to loosen ground in soils in all pits.
- C. Rinse slab surface with clean water and vacuum up with auto scrubber.
- D. Use specified "Surface Pitting Grout" material after first grind.
- E. Follow manufacturer's instructions regarding procedures.
- F. Repeat repairs in areas as required if repair material pulls out of defects. Allowing a longer curing time typically minimizes material pull out.

### 3.14 PROTECTION – INTERIOR FLOOR SLAB REPAIRS

- A. Protect surfaces of finished floor.
- B. Prohibit traffic until floor repairs have received final approval by Owner.

### 3.15 FINAL CLEANING AND PROTECTION BY GENERAL CONTRACTOR – INTERIOR SLAB SURFACE ENHANCEMENT

- A. Protect newly polished concrete finish at all times during construction to prevent oils, dirt, metal, excessive water, paint, and other potentially damaging materials from contacting the finished concrete surface. Initiate the following protective measures immediately after completion of the work.
  - 1. Communicate to Store Manager and subcontractors, vendors, and trades the importance of maintaining slab protection.
  - 2. Protect slab surface from moisture for 24 hours.
  - 3. Inspect equipment used over completed slab surface. Verify the following:
    - a. Equipment is without leaking hydraulic lines and is diapered to avoid staining. Remove all equipment with hydraulic fluid leaks from store site.
    - b. Equipment is without tire embedments (rocks, nails, screws, etc.) that will scratch or pit slab surface.
    - c. Equipment is clean and free of dust prior to start of work requiring equipment.
  - 4. Prevent contact with acids and acidic detergents.
  - 5. Use breathable drop cloths during all painting. Immediately wipe clean spilled paint.
- B. Damage to finished slab resulting from lack of protection shall be at the cost of Contractor.

### 3.16 FIELD QUALITY CONTROL

- A. Field quality control shall be the responsibility of the Contractor in accordance with Section 01452. Except as specified as mandatory, field quality control testing and inspection shall be at the discretion of the Contractor as necessary to assure compliance with Contract requirements.

END OF SECTION

WAL-MART STORES  
INTERIOR CONCRETE SLAB REPAIR AND JOINT FILLER REPLACEMENT SUBMITTAL FORM  
Section 03905 – INTERIOR CONCRETE SLAB REPAIRS AND JOINT FILLER REPLACEMENT

Date \_\_\_\_\_

WAL-MART:  SAM'S CLUB  DISCOUNT STORE  SUPERCENTER  NEIGHBORHOOD MARKET

STORE INFORMATION

---

STORE # \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY, ST \_\_\_\_\_  
GENERAL CONTRACTOR \_\_\_\_\_  
JOINT FILLER AND SLAB REPAIR \_\_\_\_\_  
SUB-CONTRACTOR \_\_\_\_\_  
JOBSITE PHONE \_\_\_\_\_

A. **ATTACHMENTS:** Include the following with this Submittal Package.

---

- Completed Interior Concrete Slab Repair and Joint Filler Replacement Qualification Statement of Conformance.
  - Letter of Certification for Joint and Slab Repair Material and Installation.
  - Product data.
  - Manufacturer and model of all equipment used relating to scope of work.
  - Anticipated Slab Enhancement Floor Polish Plan (Developed from Sheet A1.1) for the following:
    - Anticipated start and finish date of work.
    - Size, location and anticipated progression of individual nightly work areas, forecasted two weeks out from the current date of submittal.
    - Location of all joint filler replacement, cracks, spalls and other surface defects requiring repairs specified herein.
    - Electrical supply locations.
-

INTERIOR CONCRETE SLAB REPAIR AND JOINT FILLER REPLACEMENT QUALIFICATION STATEMENT OF CONFORMANCE  
SECTION 03905

Project Location: \_\_\_\_\_ Date: \_\_\_\_\_

Project Number: \_\_\_\_\_ Store Number: \_\_\_\_\_

By signing below as approved, the Contractor hereby confirms that the qualifications of the joint filler and slab repair subcontractor conforms to the qualifications as follows:

The joint filler and slab repair subcontractor has experience in finishing interior floors of similar size and scope in at least 5 previous projects. Projects name and location are identified as follows

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

Concrete Joint Filler and Slab Repair Subcontractor Company Name and Address:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Signature of Responsible Officer: \_\_\_\_\_

Typed Name and Title of Officer: \_\_\_\_\_

Telephone Number: ( \_\_\_\_\_ ) \_\_\_\_\_

General Contractor Company Name and Address:

\_\_\_\_\_  
\_\_\_\_\_

Signed by: \_\_\_\_\_ Date: \_\_\_\_\_

Submit one copy of this Statement to the Architect of Record.



## SECTION 03931 - INTERIOR CONCRETE SLAB SURFACE ENHANCEMENT (CONTRACTOR)

## PART 1 - GENERAL

## 1.1 SUMMARY

## A. Section Includes:

1. Existing interior slab surfaces exposed by removal of PVC flooring.
  - a. Removal of existing sealers, coatings, adhesives, etc. and underlayments, as necessary. Refer to Section 02023 for removal of existing flooring.
  - b. Progressive wet polishing and burnishing of slab surfaces, including application of concrete surface colorant system, to specified Finish Requirements.

## B. Furnish all labor, material, equipment, and services necessary to perform the work in this section.

1. Use of Wal-Mart owned equipment is not allowed.

## C. Related Sections:

1. Section 01330 - Submittal Procedures: Procedures for Submittals.
2. Section 01351 - Regulatory Compliance: Waste management and disposal.
3. Section 01500 - Temporary Facilities and Controls: Requirements for control of substances that have the potential for polluting surface and/or groundwater. Requirements for storage of materials and equipment at the project sit
4. Section 01770 - Contract Closeout
5. Section 03314 - Cast-in-Place Concrete Slabs (Interior)
6. Section 03905 - Interior Concrete Slab Repairs and Joint Filler Replacement.
7. Appendix B – Testing, Inspection and Observation by Owner: Procedures for inspection, testing, and documentation by Owner furnished testing laboratory.

## 1.2 REFERENCES

## A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.

## B. American Society for Testing and Materials:

1. ASTM D 1455 Standard Test Method for 60° Specular Gloss of Emulsion Floor Polish.

## C. Concrete Polishing Association of America (CPAA).

## 1.3 SUBMITTALS

## A. Within 21 days after award of prime contract, submit in accordance with procedures specified in Section 01330. Unless otherwise specified herein, send submittals to Architect of Record as specified in Section 01330.

1. Submit all submittal items required within this section in a single submittal via e-mail (maximum document size 10 Mb).
  - a. Do not submit submittals of this section together with submittals in any other section.
2. Submittals shall be complete, accurate, and in full compliance with contract requirements for proper and timely approval.
3. Maintain one copy of approved documents on site.
4. Identify submittals explicitly in accordance with Section 01330.
5. Fill out and submit attached Concrete Slab Enhancement Submittal Form attached at the end of this Section.

## B. Product data:

1. Manufacturer and model of all equipment to be used (as specified):
  - a. All propane polishing machines.

- b. Manufacturer and model of diamond polishing system. Product data and procedure of polishing must be submitted for verification of compatibility, prior to beginning slab enhancement work.
  - c. High speed burnishing equipment, including burnishing pads. Product data for pads must be submitted for verification of pad texture prior to beginning burnishing work.
  - d. Scrubber machines.
  - e. Densifier applicators/sprayers.
  - f. Concrete slurry waste disposal. Refer to Section 01500.
2. High pH Cleaner: Brand name, chemical composition, dilution rate, installation directions and certificates of compliance with required standards, if applicable.
  3. Reactive Surface Densifier and Colorant Densifier System: Brand name, chemical composition, installation directions and certificates of compliance with required standards.
- C. Slab Enhancement Subcontractor Requirements:
1. Slab Enhancement Subcontractor Qualifications: Provide to General Contractor for submittal a list of a minimum of 5 projects performed within the last two years of similar type, size, and complexity. Submit project names, addresses, contacts, phone numbers, and scope of work for each project at time of Bid and within Slab Enhancement Submittal Package.
    - a. Slab Enhancement Subcontractor shall be a contractor possessing current certifications at time of Bid.
  2. Slab Enhancement Subcontractor Certifications: Provide to General Contractor for submittal a letter of certification from manufacturers of all products and equipment specified herein. Letter shall state that the applicator is a certified applicator of the system and is familiar with proper procedures and installation methods as required by the manufacturer for:
    - a. Propane polishing equipment.
    - b. Reactive surface densifier and reactive surface colorant densifier.
  3. A minimum of one installer for work requiring manufacturer's certification, possessing manufacturer's documents that state this individual has been specifically trained, must be present during all installations of such work. Each certified individual shall retain identification noting these credential at all times for site verification.
  4. Slab Enhancement Contractor personnel shall remain the same throughout the completion of specified work, unless approved in writing by Wal-Mart.
  5. Slab Enhancement Subcontractor shall not sub-subcontract any work in this Section.
- D. Anticipated Slab Enhancement Floor Finish Plan:
1. Prior to commencement of work, submit a Floor Finish Plan (developed from Sheet A-1.1 "Floor Finish Plan") including:
    - a. Size, location and anticipated progression of individual nightly work areas, forecasted two weeks out from current date of submission.
    - b. Concrete slurry waste disposal location.
    - c. Unique work requirement locations (i.e. joint repairs, floor patching, etc.)
    - d. Anticipated start and finish date of work
  2. Use plan to document gloss value measurements, as reported weekly from CTL.
  3. Plan shall be reviewed and accepted by Wal-Mart Construction Manager and Wal-Mart Store Manager prior to start of work.
- E. Test Results:
1. Submit final floor gloss test reports produced by the CTL to the Wal-Mart Construction Manager and Wal-Mart's Concrete Consultant via email as specified.
- F. Closeout Documents: Submit in accordance with Section 01770.
1. General Contractor shall submit Final Floor Finish Plan, including the following:
    - a. Final CTL Gloss Measurements:
    - b. Digital Color Photographs, in sufficient quantity to provide general indication of quality of work performed. Images shall be emailed to Wal-Mart Construction Manager and Wal-Mart Concrete Consultant.
  2. Verification of gallons used of densifier for application.
  3. Waste management tickets/receipts/documentation from third party for disposal of concrete slurry and waste.

## 1.4 QUALITY ASSURANCE

- A. Accessibility Requirements
  - 1. Comply with applicable requirements of the Americans with Disabilities Act Accessibility Guidelines (ADAAGs) for Buildings and Facilities; Final Guidelines, revisions, and updates for static coefficient of friction for walkway surfaces.
- B. Concrete Polishing Association of America (CPAA) guideline on levels of aggregate exposure.
- C. Environmental Requirements:
  - 1. Comply with the requirements of Section 01351 for construction and demolition waste management and disposal.
  - 2. Comply with current Federal, state and local air quality regulations and with Federal requirements on concrete silica dust emissions. Do not dry grind or dry polish slab surface.
  - 3. Comply with current Federal and local toxicity and air quality regulations and with Federal requirements on content of lead, mercury, and other heavy metals. Do not use solvents in floor polish products that contribute to air pollution.
    - a. All propane powered equipment must have catalytic converters on mufflers and certification of emission testing conducted within 6 months of operation that confirms compliance with all air quality regulation.
  - 4. Limit and control all noise, dust and moisture created by concrete surface enhancement work to meet all local, state, and Federal ordinances, codes and laws.
    - a. Limit and control damage from dust or slurry caused by surface preparation and wet polishing.
  - 5. Comply with manufacturer's written instructions for substrate temperature and moisture content, ambient temperature and humidity, ventilation and other conditions affecting chemical performance.
  - 6. Close finished slab area to traffic during application and after application for a time as recommended by manufacturer.
  - 7. Define affected area with orange plastic construction fencing.
  - 8. Upon completion of densifier application, dispose of excess materials as required by local agency having jurisdiction.
    - a. Certified applicator shall remove densifier product containers from job site immediately upon completion of treatment.
- D. Walmart Concrete Consultant:
  - 1. Structural Services, Inc. (SSI): [wmr@ssiteam.com](mailto:wmr@ssiteam.com).
- E. Manufacturer's Field Representative: At the request of the Wal-Mart Construction Manager or Concrete Consultant, a manufacturer's technical qualified field representative shall be on site at to oversee work specified herein, including but not limited to the wet polishing process and installation of the surface densifier system to verify proper installation of product.
- F. Mandatory Pre-Installation Meeting:
  - 1. Plan, host, and attend a pre-installation meeting to be conducted at site by Wal-Mart Consultant via teleconference a minimum of 7 days prior to first night of slab enhancement.
    - a. Schedule pre-installation meeting with Walmart Concrete Consultant after all submittals required herein have been submitted via email and approved by Walmart Concrete Consultant.
  - 2. Obtain pre-installation meeting agenda from Walmart Concrete Consultant.
  - 3. Require responsible representatives of each party involved with the surface enhancement work to attend the pre-installation meeting. Representatives to be present shall include personnel who are directly involved in overseeing the work and who have authority to control the Work.
  - 4. Notify all required attendees in writing of scheduled time and place a minimum of 7 days in advance of pre-installation meeting. Include copy of agenda with invitation.
  - 5. General Contractor shall supply conference call information 24 hours prior to meeting.
  - 6. The pre-installation meeting shall convene only when all parties are present.
  - 7. Attendees shall include, but not be limited to the following:
    - a. Wal-Mart Construction Manager
    - b. Wal-Mart Store Planning Field Project Manager

- c. Walmart Store/Club Manager
  - d. Wal-Mart Concrete Consultant
  - e. Wal-Mart Construction Testing Laboratory.
  - f. General Contractor
  - g. Project manager
  - h. Superintendents
  - i. Diamond tooling manufacturer's representative.
  - j. Densifier manufacturer's representative
  - k. Slab Enhancement Subcontractor jobsite representative that will be overseeing all work.
  - l. Joint Filler Applicator.
  - m. Joint Filler Manufacturer
8. Review the following:
- a. Expectations of finished work specified.
  - b. Scheduling and phasing of work.
  - c. Environmental requirements (store working conditions).
  - d. Joint filler installation.
  - e. Cleaning and wet polishing procedures, including application of liquid densifier system.
  - f. Field quality control requirements.
  - g. Slab protection after completion of work.
9. Minutes of the pre-installation meeting shall be recorded, typed, printed, and distributed to all parties concerned by the General Contractor within 5 days of the meeting. One copy of the minutes shall also be transmitted to the Owner's representative for information purposes.
10. Changes to the contract documents from recommendations or discussions at the Pre-Installation meeting shall be approved in writing by the Wal-Mart Construction Manager prior to implementation. The Wal-Mart Construction Manager may require submittal of a Request for Information (refer to Section 01255). Walmart Concrete Consultant is NOT authorized to change any specified requirement or to approve execution of any portion of the work.

#### 1.5 DELIVERY, STORAGE AND HANDLING

- A. Transport, handle, store, and protect products in compliance with the requirements in Division 1 and manufacturer's recommendations.
- B. Deliver materials to site in original, factory sealed, unopened, new containers (drums) bearing manufacturer's name and label intact and legible, with the following information:
  - 1. Name or title of material.
  - 2. Manufacturer's standard container (drum) numbers.
  - 3. Application instructions.
- C. Storage:
  - 1. Refer to Section 01500.
  - 2. Store materials in protected and well-ventilated area at temperatures between 40 and 90 degrees F unless otherwise required by manufacturer.
  - 3. Keep containers sealed until ready for use.
  - 4. Do not use materials beyond manufacturer's shelf life limits.
- D. Handling: Protect materials during handling and application to prevent damage or contamination.
  - 1. Dispense reactive surface densifier materials only from factory sealed and numbered containers (drums).
  - 2. Maintain record of container (drum) numbers received and used during floor treatment.

#### 1.6 SEQUENCING AND SCHEDULING

- A. Floor Finish Plan Schedule: Provide detailed written schedule for sequence of work to ensure uninterrupted progress of Owner's on-site operations. Coordinate final approved schedule with Wal-Mart Construction Manager and Store Manager.

- B. Coordinate project phasing and relocation of racking, shelving, or merchandise to ensure minimum interference with other aspects of the Work. This may require multiple visits to job site on a given project.
- C. Scheduling of slab enhancement shall be coordinated with Wal-Mart Construction Manager and Wal-Mart Store Planning after racking has been set in final location.
- D. Conduct work in manner to minimize disruption of Owner's normal operations.
- E. Work shall begin no earlier than 15 minutes before approved start time and shall finish within one hour after approved completion time. Coordinate start time and completion time of daily work specified herein with the Wal-Mart Construction Manager, Wal-Mart Store Planning Field Project Manager, and Wal-Mart Store Manager.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Subject to compliance with project requirements, provide equipment and products as manufactured by the following to the extent as specified hereinafter:
  1. Advanced Blending (817) 477-8022 [www.advancedblending.com](http://www.advancedblending.com)
  2. American Decorative Concrete (800) 592-9320 [www.adcsc.com](http://www.adcsc.com)
  3. Brulin & Company (800) 776-7941 [www.brulin.com](http://www.brulin.com)
  4. Concrete Polishing Solutions (877) 472-8200 [www.go2cps.com](http://www.go2cps.com)
  5. Diamond Tool Supply, Inc (734) 243-9900 [www.diamondtoolsupply.com](http://www.diamondtoolsupply.com)
  6. HTC (877) 482-8700 [www.htc-america.com](http://www.htc-america.com)
  7. Onyx Environmental Solutions (800) 858-3533 [www.onyxolutions.com](http://www.onyxolutions.com)
  8. Pioneer Eclipse (800) 367-3550 [www.pioneer-eclipse.com](http://www.pioneer-eclipse.com)
  9. Prosoco (866) 363-4567 [www.prosoco.com](http://www.prosoco.com)
  10. SASE Company, Inc. (800) 522-2606 [www.sasecompany.com](http://www.sasecompany.com)
  11. Substrate Technology, Inc. (815) 941-4800 [www.surfaceprepsuperstore.com](http://www.surfaceprepsuperstore.com)
  12. Superabrasive, Inc., (800) 987-8403, <http://www.superabrasive.com/>
  13. Superior Surface Solutions, (888) 471-5227 [www.superiorsurfacesolutions.com](http://www.superiorsurfacesolutions.com)
- B. Substitutions: Comply with the requirements of Section 01600.

### 2.2 EQUIPMENT

- A. Auto Scrubber Machines: Equipment used for cleaning operations shall be Clark Encore Max38 or L38 with a head pressure of 150 lbs. or similar equipment as required to produce the specified results.
- B. Hand grinder or stand-up edger for edge grinding/polishing
- C. Rubber Base Diamond Polishing System:
  1. 21-Inch propane polishing equipment as manufactured by Onyx Environmental Solutions.
  2. System shall be by one of the following:
    - a. Vortex System by Superior Surface Solutions, contact: Webster Ryan (816) 616-5227; e-mail: [webster@ssscoinc.com](mailto:webster@ssscoinc.com).
    - b. CASH System by Substrate Technology, Inc., contact: Kristen Fox (815) 210-1027; e-mail: [kristen@substratetechnology.com](mailto:kristen@substratetechnology.com)
  3. System Diamonds:
    - a. Hybrid Rubber Diamond Dot (XDOT), grit sizes: X-Series.
    - b. Resin Rubber Diamond Dot (DOT), grit sizes: 50, 100, 200, 400, and 800.
    - c. Diamond Impregnated Pad (DIP), grit sizes: 400, 800, 1500, and 3000.
    - d. Progression of all polishing steps shall include sequential grit sizes that are not greater than twice the previous grit used.
- D. Planetary Propane Polishing Equipment:
  1. Propane polishing machines shall be in full operating condition during the duration of the night's work as

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- required to achieve specified Finish Requirements.
  - a. Refer to Section 01700 for requirements related to acceptable power sources specified hereinafter.
  - b. Polishers shall have minimum 450 pounds down force.
- 2. Planetary counter-rotating variable speed machine.
- 3. Diamonds Segments:
  - a. Diamond grinding heads shall be by one of the following manufacturers. Use heads from same manufacturer throughout entirety of project.
    - 1) HTC.
    - 2) SASE, Inc.
    - 3) Substrate Technology, Inc.
    - 4) Superabrasive, Inc.
    - 5) Superior Surface Solutions.
  - b. Diamond Segment Grit Sizes (or Manufacturer's Equivalent Designations):
    - 1) Hybrid Style Diamonds: 50 or 100.
    - 2) Resin Bonded, Phenolic Diamonds: 100 and 200.
- E. High speed propane burnisher: Equipment shall meet the specified minimum performance requirements.
  - 1. Head Size: 21 or 27 inch.
  - 2. Head Weight: 22 pound (40 pound maximum).
  - 3. Engine Size: 585 cc, generating 1,500 RPM or higher (as verified with tachometer).
  - 4. Dust skirt assembly.
- F. Burnishing Pads:
  - 1. Diamond Impregnated Pads (1500 and 3000 grit)
    - a. Vortex Diamond Impregnated Pad by Superior Surface Solutions
    - b. CASH Diamond Impregnated Pad by Substrate Technology, Inc.
- G. Sprayer for Colorant Densifier:
  - 1. Carbon dioxide sprayer.
    - a. Patriot SpraySafe System, by Patriot Sprayer Systems. Provide sprayer tips as follows:
      - 1) Red #6 spray tip - 6.4 gallons per hour.

## 2.3 PRODUCTS

- A. Joint Filler Products:
  - 1. Polyurea joint filler as specified in Section 03905.
  - 2. Color: Match polished slab surface. Sample installed must be approved by Owner's Construction Manager.
- B. High pH Cleaner:
  - 1. Amodet Degreaser/Cleaner by Advanced Blending.
  - 2. Brulin Deep Scrub Cleaner by Brulin & Co.
  - 3. Cleaner/Degreaser by Prosoco.
- C. Reactive Surface Densifier: Chemical densifier specifically for concrete surface treatment which reacts chemically to the concrete surface forming a clear, dense, durable, hard, abrasion-resistant surface. Product shall be a colorless, odorless, water-based solution that is less than 50 VOC.
  - 1. Provide one of the following:
    - a. SureLock Densifier, by American Decorative Concrete.
- D. Concrete Surface Colorant System:
  - 1. Reactive Surface Colorant Densifier: Concentrated, pre-tinted, lithium-based chemical concrete densifier specifically for concrete surface treatment which reacts chemically to the concrete surface forming a clear, dense, durable, hard, abrasion-resistant surface. Product shall be an odorless, water-based solution that is 0 VOC.
    - a. SureLock Densifier- and Densi-Color by American Decorative Concrete.
      - 1) Color: As determined by Slab Enhancement Contractor.
      - 2) Alternate color as recommended by colorant manufacturer's technical representative.

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## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine concrete slab in the presence of the certified applicator and Wal-Mart Construction Manager.

### 3.2 PREPARATION

- A. Close areas to traffic during and after floor finishing for time period recommended by product manufacturer(s). Display "Caution Wet Floor" signs as required.
- B. Cover and protect merchandise and racking to prevent damage or contamination of stored products. Provide dust drapes as required to protect merchandise from dust or debris.
- C. Prior to slab enhancement, remove kick plates from merchandise fixtures (if applicable) where fixtures shall remain in-place. Provide safe storage and re-installation of kick plates at completion of work specified herein. Coordinate with Wal-Mart Store Planning Field Project Manager.
- D. Clean Substrate: Remove surface contaminants to ensure penetration of reactive surface densifier. No hazardous, flammable, toxic or solvent based cleaning materials are permitted.
  - 1. Remove curing or sealing compounds, paint, and wax.
  - 2. Remove oil, grease and general soiling with high pH cleaner/degreaser diluted as recommended by manufacturer using swing machine with black or red pads. Use appropriate pad to achieve desired results while not exposing coarse aggregate or excessive sand within paste layer.
  - 3. Thoroughly rinse floor surface with clean water to remove soap residue and contaminants. Vacuum with auto scrubber.
  - 4. Squeegee dry.
- E. Examine surfaces and adjacent areas where products will be installed and verify that surfaces conform to the manufacturers' requirements for substrate conditions. Do not proceed until unsatisfactory conditions have been corrected.
  - 1. Verify concrete floors are free of excessive moisture and dusting.
  - 2. Clean Substrate: Remove existing surface topical treatment to ensure penetration of reactive surface densifier. No hazardous, flammable, toxic or solvent based cleaning materials are permitted.
    - a. Submit means of removal and all product data to Wal-Mart Concrete Consultant, Architect of Record, and Wal-Mart Construction Manager for approval, prior to start of work.
- F. Remove and replace existing joint filler within the limits of required slab polishing and as shown on Drawings, in accordance with Section 03905.
- G. Prior to beginning slab enhancement work specified herein, repair all slab defects within the limits of required slab polishing. Correct previous repairs not conforming to requirements of Section 03905, including any repairs not matching color of adjacent slab surface. Perform repairs in accordance with Section 03905.
  - 1. Coordinate full scope of concrete slab repair work with Wal-Mart Construction Manager.

### 3.3 GENERAL REQUIREMENTS

- A. Ensure surfaces are clean (free of oil, grease, dirt, dust, contaminants, etc.) and dry.
- B. Allow new concrete slab to achieve its 28 day strength (7 full days minimum) as documented by CTL. Approved compressive strength test report from Construction Testing Laboratory must be received by Wal-Mart Construction Manager prior to allowing polishing or color densification.
- C. Between and after final wet polishing passes, thoroughly scrub and rinse slab surface with clean water and vacuum with auto-scrubber.

- D. Sequential progression of diamond pads shall be required and limited to no more than double the grit value of the previous diamonds used.
- E. Overlap adjacent polishing passes by 25%.
- F. When using DOTs 200-grit and lower, repeatedly swing machine side-to-side 60-degrees off centerline making a minimum of two passes. Overlap second pass, and subsequent passes (if required), at slow walking pace 90-degrees to previous pass.
- G. Include all work necessary to achieve specified Finish Requirements.

### 3.4 COLOR DENSIFICATION

- A. Areas to be treated:
  1. Provide Color Densification where shown on Drawings at all areas of existing slab exposed by removal of PVC flooring.
- B. Progressively wet polish slab surface utilizing approved diamond segments as necessary to produce finishing requirements.
  1. Open slab surface by wet grinding and polishing slab surface with 150-grit metal-bonded diamond grinding head or 100-grit resin-bonded or hybrid, phenolic diamond heads.
  2. Two passes are required for the initial polishing step and all polishing steps utilizing 200-grit and below DOTs to achieve specified Finish Requirements.
  3. After completion of the above polishing steps, progressively wet polish slab surface with Rubber Base Diamond Polishing System.
  4. Use of planetary propane polishing equipment, utilizing approved resin bonded diamonds, is an acceptable alternative for only the 200-grit and lower DOTs.
  5. Final polishing pass shall be with no less than 800-grit resin.
- C. Apply reactive surface colorant densifier to dry slab surface after appropriate diamond polishing step, in accordance with manufacturer's instructions.
  1. Failure to consult with reactive surface colorant densifier manufacturer for proper dilution rate required to match adjacent concrete slab panels may result in additional cost to Contractor without an increase in Contract time.
- D. High speed burnish:
  1. Burnish slab with 1500- or 3000-grit Diamond Impregnated Pad to polish slab surface in compliance with specified Finish Requirements.
  2. Use microfiber pad after burnishing to remove any laitance and debris from slab surface.

### 3.5 FINISH REQUIREMENTS

- A. Appearance: Enhanced interior slabs areas that receive the specified slab enhancement process must consist of the following:
  1. Failure to comply with specifications to produce finish requirements may result in additional cost to Contractor without an increase in Contract time or additional disruption to Store operations.
  2. Slab surface must have a consistent look and exhibit a hard polish that is "mirror-like" in appearance with no evidence of scratching from grinding/polishing.
  3. Exposure of aggregate beyond CPAA Class B - Fine Aggregate shall be considered non-conforming work.
  4. White residue, "orange peel", or hazy appearance in the finished surface will not be accepted.
- B. Gloss: Final surface gloss values within Sales shall be between 30 and 45 as measured using a Horiba IG-320 Gloss Checker.
- C. Leave work complete and ready for final inspection by Wal-Mart Construction Manager.



### 3.6 PROTECTION

- A. General Contractor shall protect areas to receive polished concrete finish at all times during construction to prevent oils, dirt, metal, excessive water, paint and other potentially damaging materials from affecting the finished concrete surface. Protective measures listed below shall begin immediately after completion of work herein.
  - 1. Communicate to Store Manager and all subcontractors, vendors, and trades importance of maintaining slab protection at all times. Damage to finished slab resulting from lack of protection shall be repaired at no additional cost to Walmart.
  - 2. Protect slab surface from moisture for 24 hours.
  - 3. Each day, inspect all equipment used over completed slab surface, to insure:
    - a. Equipment is without leaking hydraulic lines and is diapered to avoid staining. Remove all equipment with hydraulic fluid leaks from store site.
    - b. Equipment is without tire embedments (rocks, nails, screws, etc.) that will scratch or pit slab surface.
    - c. Equipment is clean and free of dust prior to start of work
  - 4. Do not allow pipe cutting on the finished slab.
  - 5. Do not place steel on the finished slab to avoid rust staining.
  - 6. Prevent contact with acids and acidic detergents.
  - 7. Use breathable drop cloths during all painting. Immediately wipe clean spilled paint.

### 3.7 FIELD QUALITY CONTROL

- A. Field quality control shall be the responsibility of the Contractor in accordance with Section 01452. Except as specified as mandatory, field quality control testing and inspection shall be at the discretion of the Contractor as necessary to assure compliance with Contract requirements. Owner T&I specified in Appendix B shall not preclude Contractor's responsibility to perform similar routine, necessary, and customary testing and inspection of the methods and frequency suitable for the type of work involved.

### 3.8 OWNER TESTING AND INSPECTION (T&I)

- A. The Owner will perform testing and inspection as specified in Appendix B (Section 03931).

END OF SECTION

WAL-MART:  STORE  SUPERCENTER  NEIGHBORHOOD MARKET

STORE INFORMATION

---

STORE # \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY, ST \_\_\_\_\_  
GENERAL CONTRACTOR \_\_\_\_\_  
SLAB ENHANCEMENT  
SUB-CONTRACTOR \_\_\_\_\_  
JOBSITE PHONE \_\_\_\_\_

A. **ATTACHMENTS:** Include the following with this Submittal Package.

---

- Completed Concrete Slab Enhancement Qualification Statement of Conformance.

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- Letter of Certification for the following:  
Penetrating Lithium Silicate Densifier.  
Colored Concrete Densifier.  
Polishing Equipment.

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- Product data for the following:  
High pH Cleaner.  
Colored Concrete Densifier.  
Reactive Surface Densifier.

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- Waste Management Plan.

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- Manufacturer and model of all equipment used relating to scope of work per 03931, including the following:  
All propane grinding machines, including grinding heads, required to complete work specified herein.  
Auto Scrubber.  
High speed burnishing equipment, including burnishing pads. Product data for pads must be submitted for verification of pad texture prior to beginning burnishing work.  
Densifier applicators/sprayers.

---

- Anticipated Slab Enhancement Floor Polish Plan (Developed from A1.1 - Floor Finish Plan) for the following:  
Anticipated start and finish date of work.  
Size, location and anticipated progression of individual nightly work areas, forecasted two weeks out from the current date of submittal.

CONCRETE SLAB ENHANCEMENT QUALIFICATION STATEMENT OF CONFORMANCE  
SECTION 03931

Project Location: \_\_\_\_\_ Date: \_\_\_\_\_

Project Number: \_\_\_\_\_ Store Number: \_\_\_\_\_

By signing below as approved, the Contractor hereby confirms that the qualifications of the Slab Enhancement Subcontractor conforms to the qualifications as follows:

The Concrete Slab Enhancement Subcontractor has experience in finishing interior floors of similar size and scope in at least 5 previous projects. Projects name and location are identified as follows

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

Concrete Slab Enhancement Subcontractor Company Name and Address:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Signature of Responsible Officer: \_\_\_\_\_

Typed Name and Title of Officer: \_\_\_\_\_

Telephone Number: (\_\_\_\_\_) \_\_\_\_\_

General Contractor Company Name and Address:

\_\_\_\_\_  
\_\_\_\_\_

Signed by: \_\_\_\_\_ Date: \_\_\_\_\_

Submit one copy of this Statement to the Architect of Record.

## SECTION 04200 (04 2000) - UNIT MASONRY ASSEMBLIES

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
1. Concrete masonry units.
  2. Mortar and grout.
  3. Reinforcement, anchorages, and accessories.
- B. Related Requirements: The following list is intended to aid in locating work related to or dependent on the scope of Work in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
1. Section 01351 – Regulatory Compliance.
  - 2.
  3. Section 05090 - Concrete and Masonry Anchors. Mechanical and adhesive type anchor studs, expansion bolts, sleeve anchors, adhesive anchors, and anchor bolts embedded in masonry for supporting structural members.
  4. Section 05120 - Structural Steel: Support plates and angles.
  5. Section 05500 - Metal Fabrications: Loose steel lintels and other metal components embedded in masonry.
  6. Section 07900 - Joint Sealers: Filler, backer rod and sealant for control and expansion joints.
  7. Appendix B – Testing, Inspection, and Observation by Owner.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. American Concrete Institute (ACI):
1. ACI 315 - ACI Detailing Manual.
- C. Masonry Standards Joint Committee (MSJC):
1. TMS 402/ACI 530/ASCE5 and TMS 602/ACI 530/ASCE 6 - Building Code Requirements and Specifications for Masonry Structures.
- D. American Society for Nondestructive Testing (ASNT)
1. Recommended Practice No. SNT-TC-1A - Personnel Qualification and Certification in Nondestructive Testing.
- E. ASTM International (ASTM):
1. ASTM A 36 - Carbon Structural Steel
  2. ASTM A 153 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
  3. ASTM A 615 - Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
  4. ASTM C 34 - Structural Clay Load-Bearing Wall Tile.
  5. ASTM C 39 - Compressive Strength Of Cylindrical Concrete Specimens
  6. ASTM C 56 - Structural Clay Nonloadbearing Tile.
  7. ASTM C 62 - Building Brick (Solid Masonry Units Made From Clay or Shale).
  8. ASTM C 67 - Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile.
  9. ASTM C 90 - Hollow Load-Bearing Concrete Masonry Units.
  10. ASTM C 91 - Masonry Cement.
  11. ASTM C 94 - Ready-Mixed Concrete.
  12. ASTM C 129 - Non-Load-Bearing Concrete Masonry Units.

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13. ASTM C 140 - Methods For Sampling And Testing Concrete Masonry Units And Related Units.
14. ASTM C 143 - Slump of Hydraulic Cement Concrete.
15. ASTM C 144 - Aggregate for Masonry Mortar.
16. ASTM C 150 - Portland Cement.
17. ASTM C 207 - Hydrated Lime for Masonry Purposes.
18. ASTM C 216 - Facing Brick (Solid Masonry Units Made from Clay or Shale).
19. ASTM C 270 - Mortar for Unit Masonry.
20. ASTM C 331 - Lightweight Aggregates for Concrete Masonry Units.
21. ASTM C 404 - Aggregates for Masonry Grout.
22. ASTM C 476 - Grout for Masonry.
23. ASTM C 516 - Vermiculite Loose Fill Thermal Insulation.
24. ASTM C 549 - Perlite Loose Fill Insulation.
25. ASTM C 578 - Rigid, Cellular Polystyrene Thermal Insulation.
26. ASTM C 618 - Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
27. ASTM C 652 - Hollow Brick (Hollow Masonry Units Made From Clay or Shale)
28. ASTM C 780 - Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry.
29. ASTM C 979 - Pigments for Integrally Colored Concrete.
30. ASTM C 1019 - Method of Sampling and Testing Grout.
31. ASTM C 1088 – Thin Veneer Brick Units made from Clay or Shale.
32. ASTM C 1142 - Extended Life Mortar for Unit Masonry.
33. ASTM C 1329 - Mortar Cement.
34. ASTM C 1384 - Admixtures for Masonry Mortars.
35. ASTM C 1634 – Concrete Facing Brick.
36. ASTM C 1714 - Preblended Dry Mortar Mix for Unit Masonry.
37. ASTM E 119 - Fire Tests for Building Construction and Materials.
38. ASTM E 514 - Standard Test Method for Water Penetration and Leakage Through Masonry.
39. ASTM E 2265 - Anchors and Fasteners in Concrete and Masonry.
40. ASTM F 1554 - Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.

- F. Mason Contractors Association of America (MCAA):
1. Standard Practice for Bracing Masonry Walls Under Construction.

- G. Occupational Safety and Health Administration (OSHA):
1. OSHA 01926.1153 Respirable Crystalline Silica.

### 1.3 ENVIRONMENTAL REQUIREMENTS

- A. Minimize dust emissions and provide equipment that suppresses dust.

### 1.4 ADMINISTRATIVE REQUIREMENTS

- A. On-Site Masonry Construction Meeting:
1. Convene On-Site Masonry Construction Meeting during the structural engineer's (SER) first scheduled Site Observation (reference section 01454).
  2. Attendees shall include, but not be limited to:
    - a. Owner's Construction Manager (attendance desired but optional).
    - b. General Contractor.
      - 1) Project Manager.
      - 2) Superintendent.
    - c. Concrete Subcontractor.
    - d. Masonry Subcontractor.
    - e. Owner's Construction Testing Laboratory (CTL),
    - f. Structural Engineer of Record (SER) or representative.

3. Coordinate with Structural Engineer of Record and notify all other attendees at least one week prior to meeting.
4. Review all items included in Agenda (to be provided by SER).
5. Record meeting notes directly on agenda and furnish copy of notes to each party attending.

## 1.5 SUBMITTALS

- A. Submittal Procedures: Unless otherwise specified herein, submit in accordance with procedures specified in Section 01330.
  1. Submit all submittals electronically in PDF format via email, unless otherwise specified, to Architect of Record except when specified to be submitted to the Structural Engineer of Record and/or the Owner's Construction Testing Laboratory.
  2. Unless otherwise specified, submit required submittals prior to Pre-installation Conference.
- B. Shop Drawings: Do not use reproductions of Contract Documents as shop drawings. Prepare shop drawings in accordance with ACI 315 and submit within 5 working days of Contract Date.
  1. Reinforcement:
    - a. Include masonry notes on shop drawings that relate to proper placing of reinforcing and submit shop drawings for use in the field.
    - b. Include vertical and horizontal wall reinforcement, dowels, bond beam reinforcement, embedded steel items and anchor bolts.
  2. Placement Drawings:
    - a. Include sides, front and rear elevations of building showing masonry walls full height and length; reinforcing size, quantity, spacing, location, length, and grade of steel; location of cleanouts and control joint locations.
- C. Masonry Grout Mix Design: Complete and submit Masonry Grout Mix Design Form found at the end of this Section for each type of grout. Submit by email to Structural Engineer of Record and Owner's Construction Testing Laboratory (CTL) as specified in Section 01330 within 5 working days of Contract Date.
- D. Masonry Mortar: Submit dry pre-blended masonry mortar manufacturer's certification letter and lab test reports verifying conformance to ASTM C270 and ASTM C1714. Include description of mortar type. Submit by email to Structural Engineer of Record and Owner's Construction Testing Laboratory as specified in Section 01330 within 5 working days of Contract Date.
- E. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net area compressive strength of masonry units, mortar type, and resulting net area compressive strength of masonry.
- F. Insulation Inspection Report: Submit to Architect of Record.

## 1.6 QUALITY ASSURANCE

- A. Construct masonry in accordance with TMS 402/ACI 530/ASCE5 and TMS 602/ACI 530/ASCE 6.
- B. Pre-construction Testing: Engage a qualified independent testing agency to perform testing indicated below at Contractor's expense prior to beginning construction of masonry walls.
  1. Grout Test (Compressive Strength): For each mix required, according to ASTM C 1019.
- C. Installer Qualifications: Installers of foamed-in-place insulation and blown-in expanded bead insulation shall be certified or approved by insulation manufacturer.
- D. Source Limitations:

1. Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, through one source from a single manufacturer for each product required.
2. Mortar Materials: Obtain mortar ingredients of uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from one source or producer for each aggregate.

#### 1.7 DELIVERY, STORAGE AND HANDLING

- A. Transport, handle, store, and protect products in compliance with the requirements of Section 01600 and manufacturer's recommendations.
- B. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.
- C. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- D. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- E. Deliver preblended, dry mortar mix in moisture-resistant containers designed for use with dispensing silos. Store preblended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in covered weatherproof dispensing silos.
- F. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

#### 1.8 PROJECT CONDITIONS

- A. Follow cold and hot weather procedures of MSJC.
- B. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
  1. Extend cover a minimum of 24 inches down both sides of walls and hold cover securely in place.
  2. Where one wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches down face next to unconstructed wythe and hold cover in place.
- C. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three days after building masonry walls or columns.
- D. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
  1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
  2. Protect sills, ledges, and projections from mortar droppings.
  3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
  4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.
- E. Cold Weather Construction: When ambient air temperature is below 40 F, implement cold weather procedures and comply with the following:
  1. Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions.
  2. Preparation: Comply with the following requirements prior to conducting masonry work:

- a. Do not lay masonry units having either a temperature below 20 F or containing frozen moisture, visible ice, or snow on their surface.
  - b. Remove visible ice and snow from the top surface of existing foundations and masonry to receive new construction. Heat these surfaces above freezing using methods that do not result in damage.
3. Construction: These requirements apply to work in progress and are based on ambient air temperature. Do not heat water or aggregates used in mortar or grout above 140 F. Comply with the following requirements during construction during the following ambient air conditions:
- a. 40 F to 32 F: Heat mixing water to produce mortar temperature between 40 F and 120 F at the time of mixing. Grout does not require heated materials, unless the temperature of the materials is below 32 F.
  - b. 32 F to 25 F: Heat mixing water to produce mortar temperature between 40 F and 120 F at the time of mixing. Maintain mortar temperature above freezing until used in masonry. Heat grout aggregates and mixing water to produce grout temperature between 70 F and 120 F at the time of mixing. Maintain grout temperature above 70 F at the time of grout placement.
  - c. 25 F to 20 F: Comply with requirements for 32 F to 25 F above and the following: Heat masonry surfaces under construction to 40 F and use wind breaks or enclosures when the wind velocity exceeds 15 mph. Heat masonry to a minimum of 40F prior to grouting.
  - d. 20 F and below: Comply with requirement for 35 F to 20 F above and the following: Provide an enclosure and auxiliary heat to maintain air temperature above 32 F within the enclosure.
4. Protection: These requirements apply after masonry is placed and are based on anticipated minimum daily temperature for grouted masonry and anticipated mean daily temperature for ungrouted masonry. Protect completed masonry in the following manner:
- a. 40 F to 25 F: Protect newly constructed masonry by covering with a weather-resistive membrane for 24 hr after being completed.
  - b. 25 F to 20 F: Cover newly constructed masonry completely with weather-resistive insulating blankets, or equal protection, for 24 hr after completion of work. Extend time period to 48 hr for grouted masonry unless the only cement in the grout is Type III Portland cement.
  - c. 20 F and below: Maintain newly constructed masonry temperature above 32 F for at least 24 hr after being completed by using heated enclosures, electric heating blankets, infrared lamps, or other acceptable methods. Extend time period to 48 hr for grouted masonry unless the only cement in the grout is Type III Portland cement.
5. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.
- F. Hot Weather Construction: Comply with the following provisions:
1. Preparation: Prior to conducting masonry work:
    - a. When the ambient air temperature exceeds 100 F or exceeds 90 F with a wind velocity greater than 8 mph:
      - 1) Provide necessary conditions and equipment to produce mortar having a temperature below 120 F.
    - b. When the ambient temperature exceeds 115 F or exceeds 105 F with a wind velocity greater than 8 mph, implement the requirements above for ambient air temperature exceeding 100 F and shade materials and mixing equipment from direct sunlight.
  2. Construction: While masonry work is in progress:
    - a. When the ambient air temperature exceeds 100 F, or exceeds 90 F with a wind velocity greater than 8 mph:
      - 1) Maintain temperature of mortar and grout below 120 F.
      - 2) Flush mixer, mortar transport container, and mortar boards with cool water before they come into contact with mortar.
      - 3) Maintain mortar consistency by retempering with cool water.
      - 4) Use mortar within 2 hours of initial mixing.
    - b. When the ambient temperature exceeds 115 F or exceeds 105 F with a wind velocity greater than 8 mph, implement the construction requirements above for ambient air temperature exceeding 100 F and use cool mixing water for mortar and grout. Ice is permitted in the mixing water prior to use. Do not permit ice in the mixing water when added to the other grout materials.



3. Protection: When the mean daily temperature exceeds 100 F or exceeds 90 F with a wind velocity greater than 8 mph, fog spray newly constructed masonry until damp at least three times a day until the masonry is three days old.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Provide unit masonry, mortar, and grout that develops compressive strength (f'm) at 28 days as indicated on Drawings.

### 2.2 CONCRETE MASONRY UNITS

- A. Unit Design: Modular two core units sized as indicated or scheduled. Provide special shapes necessary for bond beams, control and expansion joints, lintels, and special conditions.
  1. Provide units as required for indicated construction including sill units and solid cap units.
  2. Provide units with exposed faces which are uniform in appearance.
- B. Load Bearing Units: ASTM C 90.
  1. Smooth CMU: Light weight or normal weight above finished floor; normal weight only below finished floor.
  2. Split Face CMU: Light weight or normal weight above finished floor; normal weight only below finished floor.
  3. Contractor's Option: Lightweight reduced web concrete masonry unit.
    - a. ProBlock, as distributed by Johnson Concrete, Lexington, NC, (336) 248-2918.

- C. Non-load Bearing Units: ASTM C 129.
  - 1.

### 2.3 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C 150, Type I or Type II. Provide natural color or white cement as required to produce mortar color indicated.
- B. Mortar Cement: ASTM C 1329.
- C. Fly Ash for Grout: ASTM C 618, Type C or F maximum 4 percent loss in ignition. Substitute Fly Ash for Portland Cement at a minimum of 25 percent and a maximum of 30 percent of the total cementitious content. Use only one source and type throughout project.
- D. Ground Granulated Blast Furnace Slag (GGBFS) for Grout: ASTM C 989, Grade 100 or 120. Substitute GGBFS for Portland Cement at 25 percent of the total cementitious content. Use only one source and type throughout project.
- E. Masonry Cement: ASTM C 91.
- F. Mortar Aggregate: ASTM C 144.
  1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
  2. For joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.
  3. White-Mortar Aggregates: Natural white sand or crushed white stone.
  4. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.
- G. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes and complying with ASTM C 979. Use pigments with a record of satisfactory performance in masonry mortar.

- H. Grout Aggregate: ASTM C 404; use of blast furnace slag is not permitted. Maximum coarse aggregate size, 3/8 inch.
- I. Calcium chloride: Not permitted in mortar or grout. Chemicals containing thiocyanates, calcium chloride or more than 0.1 percent chloride ions shall not be used.
- J. Hydrated Lime: ASTM C 207, Type S.
- K. Water: Potable.
- L. Admixtures: Not permitted in mortar or grout except as otherwise specifically allowed or required herein.

#### 2.4 MIXES - MORTAR

- A. Mortar: Type S, in accordance with Property Specification of ASTM C 270 for dry pre-blended mortar.
  - 1. Site batching of components is prohibited.
  - 2. Mixing on-site water and packaged dry blended mix is acceptable.
  - 3. Provide pre-blended mortar produced, packaged and delivered per ASTM C 1714 from one of the following manufacturers:
    - a. [Quikrete, Inc.](#), Atlanta, GA (800) 282-5828.
    - b. [SPEC MIX, LLC](#), Eagan, MN, (888) 773-2649.
    - c. [Amerimix](#) (a Bonsal/Oldcastle company), (866) 725-7383.
    - d. [Pro-Mix](#) Masonry Mortar Type S by [Ash Grove Packaging](#) (Oldcastle APG), Little Rock, AR (888) 289-1117.
  - 4. Ready mix mortar (ASTM C 1142) is prohibited.
  - 5. Do not add admixtures of any kind to mortar mix except as specifically required herein.
  - 6. Provide pre-blended mortar containing integral water repellent pretested to comply with the performance requirements of ASTM C 1384 and compatible with integral water repellent of architectural masonry units specified in this Section. Water-repellent admixture shall be added by the pre-blended mortar manufacturer.
- B. Pointing Mortar: Provide pointing mortar identical to original mortar as specified in this Section.
- C. Mortar Color (CMU): Match color of integrally colored or unpainted natural color CMU. Color of mortar at painted CMU is optional.
- D. Mortar Color (Architectural Masonry): Uncolored natural gray.
- E. Mortar Color: As required to match existing, subject to approval by Owner's Construction Manager. Control mortar mix to obtain desired color.

#### 2.5 MIXING – MORTAR

- A. Thoroughly mix mortar ingredients in accordance with ASTM C 270, in quantities needed for immediate use.
  - 1. Do not use anti-freeze compounds.
  - 2. If water is lost by evaporation, retemper only within 2 hours of mixing. Do not retemper mortar more than 2 hours after mixing.

#### 2.6 MIXES - GROUT FILL

- A. Grout fill for concrete masonry unit bond beams, lintels, and reinforced cells with reinforcing bars and embedded plates: Conform to ASTM C 476.
  - 1. Compressive Strength: 2000 psi minimum at 28 days, as determined in accordance with the provisions of ASTM C 1019.
  - 2. Slump: 10 inches, minimum; 11 inches, maximum, taken in accordance with ASTM C 143.

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3. Grout mix shall contain supplementary cementitious materials (SCM). Either fly ash or ground granulated blast furnace slag (GGBFS) may be used for the SCM but shall not be used together to form a ternary mix. Use of fly ash or GGBFS in the concrete mix is mandatory.
4. Use coarse grout when grout space is equal to or greater than 4 inches in both directions.
5. Use fine grout when grout space is smaller than 4 inches in either direction.
6. Air entrainment shall not be used.
7. Do not add admixtures to grout.

## 2.7 MIXING – GROUT

- A. Batch and mix grout in accordance with ASTM C 94 or ASTM C 476 for site batched and mixed grout. Do not use anti-freeze compounds to lower the freezing point of grout.

## 2.8 REINFORCEMENT

- A. Horizontal Joint Reinforcement: Ladder design, minimum 9 gage welded steel wire, hot dipped galvanized to 1.5 oz, ASTM A 153, Class B2. Width 1-1/2 to 2 inches less than wall thickness.
- B. Deformed Bars: ASTM A 615, Grade 60. Shop fabricate reinforcement which is shown bent or hooked. Field bending not allowed.
- C. Anchor bolts and threaded rods as shown embedded in masonry on structural drawings: ASTM F 1554 for anchor bolts and ASTM A 36 for threaded rods.
- D. Bar Positioners for Vertical Wall Bars: Wire units designed to fit into mortar bed joints spanning masonry unit cells and hold reinforcing bars in center of cells. Provide units formed from 0.148-inch steel wire, hot-dip galvanized after fabrication and designed for number of bars indicated. Provide products by the following or equivalent by other manufacturers.
  1. [Hohmann & Barnard, Inc.](#), Hauppauge, NY (800) 645-0616.
  2. [Wire-Bond](#), Charlotte, NC (800) 849-6722.
  3. [Steel-Wich](#) Telescoping Rebar Positioner, (716) 683-7526.

## 2.9 TIES AND ANCHORS

## 2.10 ACCESSORIES

## 2.11 MASONRY FILL INSULATION

- A. Provide one of the following types of masonry fill insulation.
  1. Foamed-in-place Insulation: Subject to compliance with project requirements and local jurisdictional restrictions, manufacturers offering foamed-in-place insulation tested and found compatible and non-detrimental within the indicated Underwriters Laboratory fire resistance assemblies which may be incorporated into the Work include the following:
    - a. [Core-Fill 500](#) by Tailored Chemical Products, Inc., Hickory, NC, (800) 627-1687.
    - b. [CoreFoam Masonry Foam Insulation or InsulSmart MH](#) by cfiFOAM Inc., Knoxville, TN, (800) 656-3626.
    - c. [RetroFoam](#) for Block Walls (a division of Polymaster), (800) 580-3626.
    - d. [GacoProFill](#) Polyurethane Foam Insulation by Gaco, (800) 331-0196.

## 2.12 SUBSTITUTIONS

- A. Comply with the requirements of Section 01600.

## PART 3 - EXECUTION

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### 3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
  - 1. Verify that foundations are within tolerances specified.
  - 2. Verify that reinforcing dowels are properly placed.
  - 3. Verify items specified under other Sections of work are properly sized and located.

### 3.2 PREPARATION

- A. Establish lines, levels, and coursing. Protect from disturbance. Use non-corrosive materials in contact with masonry work.
- B. Provide temporary bracing for walls, lintels, and other masonry work during erection. Maintain in place until roof and other structural elements are complete and provide permanent bracing.
- C. Provide temporary bracing for walls, lintels, and other masonry work during erection.
  - 1. Design bracing in accordance with MCAA Standard Practice for Bracing Masonry Walls Under Construction.
  - 2. Design bracing under supervision of an independent Professional Engineer hired by the contractor and licensed in the state in which the project is located.
  - 3. Maintain in place until roof and other structural elements are complete and provide permanent bracing.
- D. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds 30 g/30 sq. in. per minute when tested in accordance with ASTM C 67. Allow units to absorb water until damp but not wet at time of laying.

### 3.3 INSTALLATION - GENERAL

- A. Construct masonry in accordance with MSJC.
- B. Thickness: Build cavity and composite walls and other masonry construction to full thickness shown. Build singlewythe walls to actual widths of masonry units, using units of widths indicated.
- C. Build chases and recesses to accommodate items specified in this and other Sections.
- D. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to opening.
- E. Use full-size units without cutting if possible.
- F. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws equipped with proper dust control systems as specified herein.
  - 1. Provide clean, sharp, unchipped edges.
  - 2. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.
- G. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures. Mix units from several pallets or cubes as they are placed.

### 3.4 COURSING

- A. Place masonry to lines and levels indicated.
- B. Maintain masonry courses to uniform width. Make vertical and horizontal joints equal and of uniform thickness.

- C. Lay concrete masonry units in running bond unless otherwise noted. Course one block unit and one mortar joint to equal 8 inches (4 inches for half high units).
- D. Tool head and bed joints concave when mortar is thumbprint hard regardless if below grade or above ceiling height. Use tool with large enough radius that joint is not raked free of mortar.
- E.

### 3.5 PLACING AND BONDING

- A. Lay solid concrete masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not slush head joints. Remove excess mortar.
- B. For hollow concrete masonry units, fill head and bed joints solidly with mortar for a distance in from the face of the unit not less than the thickness of the shell. Bed webs in mortar in starting course on footings and foundation walls and in courses of piers, columns and pilasters, and where adjacent to cells or cavities to be reinforced or filled with concrete or grout. For starting courses on footings, spread out full mortar bed, including areas under cells.
- C. Limit height of vertical grout pours to not more than 12'-8" or the distance between bond beams, whichever is less.
- D. Provide cleanouts at the bottom course of grout lifts for pours over 5'-0" in height. Provide cleanouts at the bottom course of each vertical bar location in partially grouted masonry. Provide cleanouts at 32 inches on center along the bottom course of the grout lifts in fully grouted masonry. Use cleanouts to remove all mortar droppings and debris and ensure proper placement of reinforcement.
- E. Do not place grout until height of masonry to be grouted has attained enough strength to resist grout pressure. Allow masonry to cure a minimum of 4 hours prior to placing grout for pours between 5'-0" and 12'-8. Increase curing time to a minimum of 8 hours in cold or dry weather conditions.
- F. Solid grout hollow masonry cells as noted on Structural Drawings. Use grout method of construction conforming to requirements of current MSJC. Grout space dimensions and maximum pour heights shall comply with MSJC. Grout lift pour heights shall not exceed 12'-8".
- G. Grouting shall be a continuous procedure for each lift. Do not allow horizontal construction joint to form by discontinuing grouting
- H. Grout masonry cells to comply with MSJC. for Seismic Design Category (SDC) indicated on structural drawings.
- I. Fully bond intersections, and external and internal corners.
- J. Do not shift or tap masonry units after mortar has taken initial set. Where adjustment must be made, remove mortar and replace.
- K. Perform jobsite cutting with proper tools to provide straight unchipped edges and equipped with proper dust control systems as specified herein. Take care to prevent breaking masonry unit corners or edges.
  1. Where required, match finish masonry work to adjacent surfaces.
  2. For fire-rated walls, construct walls to finish against bottom of roof or floor deck and fill voids with firestopping.
  3. For other than fire-rated walls, cut units to match the slope of the roof deck and finish construction to within 2 inches of and parallel to roof deck.
- L. Isolate masonry partitions from vertical structural framing members with a control joint.

### 3.6 TOLERANCES

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- A. Construct masonry within the following tolerances:
  1. Alignment of Pilasters: Maximum 1/4 inch from true line.
  2. Variation from Plane of Wall: 1/4 inch in 10 feet; 3/8 inch in 20 feet; 1/2 inch maximum.
  3. Variation from Plumb: 1/4 inch per story non-cumulative.
  4. Variation from Level Coursing: 1/8 inch in 3 feet; 1/4 inch in 10 feet; 1/2 inch maximum.
  5. Variation of Joint Thickness: 1/8 inch in 3 feet.
  6. Variation from Unit to Adjacent Unit: 1/32 inch maximum.
- B. Tolerances for the placement of reinforcing steel in walls and flexural elements:
  1.  $\pm 1/2$  inch when the distance from the centerline of the steel to the opposite face of the masonry, "d", is equal to 8 inches or less.
  2.  $\pm 1$  inch for "d" equal to 24 inches or less but larger than 8 inches.
  3.  $\pm 1-1/4$  inch for "d" greater than 24 inches.

### 3.7 REINFORCEMENT AND ANCHORAGES

- A. Install horizontal joint reinforcement 16 inches on center, except space at 8 inches in parapet walls and below finished floor, or where otherwise indicated on Drawings. Place joint reinforcement continuous in first and second joint below top of walls. Lap joint reinforcement ends minimum 6 inches. Do not extend joint reinforcement through control joints.
- B. Set vertical reinforcing bars supported and secured against displacement by means of bar positioners prior to placing grout located near the ends of each bar and at intermediate intervals of not more than 192 diameters of the reinforcement. Minimum clearance between parallel bars shall be one diameter of the reinforcement. A minimum clearance of 1/2 inch shall be maintained between the bars and masonry units. Set and support other bars, anchor bolts, and embedded items and tie to prevent displacement prior to placing grout.
- C. Grout cells full that contain vertical reinforcing. Use grout method of construction conforming to requirements of MSJC.
- D. Place grout barrier below reinforced bond beams as required to prevent grout falling through cells while maintaining positive bond in mortar joint.
- E. Anchorage of Masonry Walls: Comply with applicable requirements of MSJC for Seismic Design Category (SDC) indicated on structural drawings.
- F. Verify that anchorages embedded in masonry are properly placed.
  1. Proper placement of embed anchors shall be full depth penetration of scheduled anchorage without contact of embed stud with interior surface of exterior shell face.
- G. After reinforcing of masonry is securely tied in place, plug cleanout holes with masonry units. Brace against wet grout pressure.

### 3.8 MASONRY FILL INSULATION

- A. Confirm that selected foam insulation material is compatible and non-detrimental to referenced fire resistance assemblies before use.
- B. Install insulation in masonry unit cores of exterior walls.
- C. Foamed-in-place Insulation:
  1. Install foam insulation in strict accordance with manufacturer's published instructions.
  2. Pump foam insulation bored into mortar joints around entire wall area 3 feet from floor level. Repeat at height no greater than ten feet until completion of wall area.
  3. Plug holes with mortar after completion.

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- D. Granular Insulation:
1. Place masonry fill insulation in accordance with manufacturer's instructions. Verify that holes and openings have been sealed to prevent escape of insulation.
  2. Place as masonry is erected. Ensure spaces are free of mortar to allow free flow of insulation.
  3. Completely fill spaces. Place in lifts and rod to eliminate air pockets. Place prior to covering cores with bond beams or lintels.
  4. Place temporary signs on face of insulated walls warning workers to use caution to prevent loss of insulation if cutting into walls.

### 3.9 LINTELS

- A. Install loose steel lintels as scheduled.
- B. Install reinforced unit masonry lintels over openings where steel lintels are not scheduled. Construct lintels using grout fill and reinforcing. Maintain minimum 8 inch bearing on each side of opening, unless noted otherwise on Drawings.
- C. Use reinforcing bars of one piece lengths only.
- D. Place and consolidate grout fill without disturbing reinforcing. Allow lintels to reach strength before removing temporary supports.
- E. For soap units covering steel lintels, provide 9 gage Z-ties at each vertical joint. Weld Z-ties to web of steel lintel.

### 3.10 CONTROL JOINTS

- A. Do not continue bond beam reinforcing (except at floor and roof levels and top of walls) or joint reinforcing across control joints unless otherwise shown on Drawings.
- B. Install preformed control joint filler at locations indicated on Drawings. Use proper size material to create sealant joint space.
- C. Install backer rods and sealant at control joints as shown on Drawings and as specified in Section 07900.

### 3.11 EXPANSION JOINTS

- A. Install expansion joints if shown on Drawings.
- B. Do not continue bond beam reinforcing (except at floor and roof levels and top of walls) or joint reinforcing across expansion joints unless otherwise shown on Drawings.
- C. Install expansion joint filler (compression seal), backer rods, and sealant at expansion joints as shown on Drawings and as specified in Section 07900.

### 3.12 BUILT-IN WORK

- A. As work progresses, build in metal door frames, fabricated metal frames, window frames, anchor bolts, diaphragm anchors, embedded plates, and other items specified in other Sections.
- B. Install items plumb and level.
- C. Bed anchors of metal door and glazed frames in mortar joints. Fill frame voids solid with grout or mortar. Fill masonry cores with grout minimum 12 inches from framed openings.

- D. Do not build in organic materials subject to deterioration.

### 3.13 CUTTING AND FITTING

- A. Perform jobsite cutting with tools equipped with an integrated water delivery system that continuously feeds water to the blade or a HEPA-rated filter dust collection vacuum system recommended by the manufacturer to maintain dust emissions below the permissible level.
- B. Cut and fit for bearing plates, chases, pipes, conduit, sleeves, and grounds. Coordinate work specified in other Sections to provide correct size, shape, and location.
- C. Obtain approval prior to cutting or fitting any area not indicated or where appearance or strength of masonry work may be impaired.

### 3.14 CLEANING

- A. In-Progress Cleaning: As the work progresses, clean unit masonry by dry brushing. Before tooling joints, remove mortar fins and smears. Use proper dust control methods for dry cleaning and mortar removal.
- B. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
  1. Remove large mortar particles and excess mortar by hand with wooden paddles and nonmetallic scrape hoes or chisels.
  2. Use non-metallic tools in cleaning operations.
  3. Protect non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
  4. Consult masonry unit manufacturer for acceptable cleaners. Use cleaners intended for use on the type of masonry to which it is applied and which will not harm masonry or adjacent materials.
  5. Clean non-colored CMU masonry with a proprietary acidic cleaner applied according to cleaning product manufacturer's written instructions.
  6. Clean architectural masonry with a low-acidic proprietary cleaner containing no muriatic acid such as [Enviro Klean Safety Klean](#) or [Sure Klean Light Duty Concrete Cleaner](#) by [Prosoco, Inc.](#), or [NMD 80](#) by [EaCo Chem](#), applied according to cleaning product manufacturer's written instructions.
- C. Replace defective mortar. Match adjacent work.
- D. Dispose of construction waste in accordance with the requirements of Section 01351 Regulatory Compliance Supplement.

### 3.15 PROTECTION

- A. Maintain protective boards at exposed external corners which may be damaged by construction activities.
- B. Provide protection without damaging completed work.
- C. Protect the base of walls from rain-splashed mud and mortar droppings.
- D. At day's end, cover unfinished walls to prevent moisture infiltration. Weight cover down to prevent blow-off and maintain protection for fresh masonry work. Extend cover from top of wall a minimum of 2 feet down the wall on each side.

### 3.16 FIELD QUALITY CONTROL

- A. Field quality control shall be the responsibility of the Contractor in accordance with Section 01452. Except as specified as mandatory, field quality control testing and inspection shall be at the discretion of the Contractor as



necessary to assure compliance with Contract requirements. Owner T&I specified below shall not be considered a substitute for the Contractor's responsibility to perform similar routine, necessary, and customary testing and inspection of the methods and frequency suitable for the type of work involved.

- B. Blown-In Expanded Polystyrene Bead Insulation Inspection: Upon completion of installation, perform infrared thermographic inspection of exterior walls. Insulation testing shall be mandatory.
1. Thermographer Qualifications: ASNT NDT Level II certification, certified in accordance with ASNT Recommended Practice SNT-TIC-1A, with at least three years' experience performing infrared inspections of building envelopes.
  2. Infrared Equipment: E-Series bx thermal imager by [Flir Systems Incorporated](#) or equivalent.
  3. Environmental Conditions: Perform thermographic inspection under the following conditions.
    - a. From exterior of building with building in heated mode.
    - b. Post-sunset, from ground level, with inside/outside temperature differential of at least 18 degrees F.
    - c. Exterior wall surfaces shall be dry at time of inspection and winds at less than 15 miles per hour.
  4. Inspection Report: Submit Inspection Report including recorded images of all insulated surfaces prepared by Thermographer. Submit as specified in Part 1.

### 3.17 OWNER TESTING AND INSPECTION (T&I)

- A. The Owner will perform testing and inspection as specified in Appendix B (Section 04200).

END OF SECTION

**MASONRY GROUT MIX DESIGN SUBMITTAL FORM**  
 (Section 04200 – Unit Masonry Assemblies)

Date \_\_\_\_\_

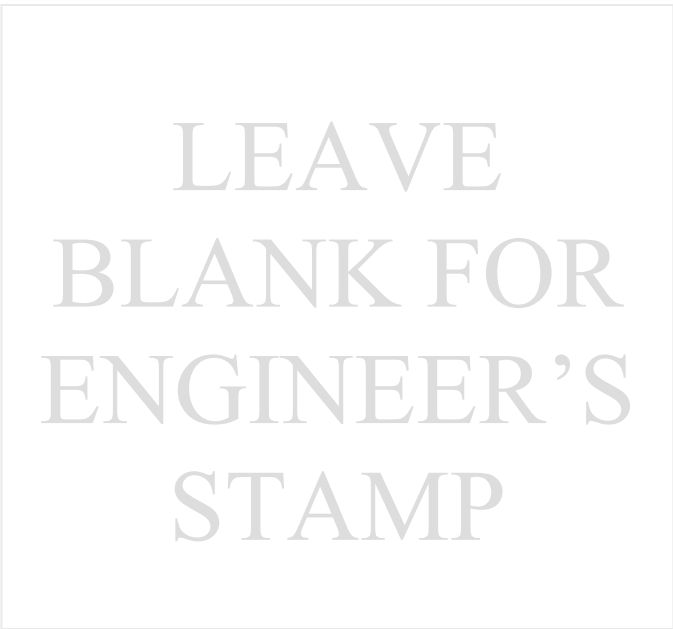
SUPERCENTER  MARKET  SAM'S CLUB

**STORE INFORMATION**

**STORE #** \_\_\_\_\_  
**ADDRESS** \_\_\_\_\_  
**CITY, ST** \_\_\_\_\_  
**GENERAL CONTRACTOR**  
**COMPANY** \_\_\_\_\_  
**JOBSITE PHONE** \_\_\_\_\_

**A. GROUT INFORMATION**

<p><b>Supplier Mix Design #</b> _____</p> <p><b>Design Strength (f'c)</b> _____ psi</p> <p><b>Water / Cementitious Ratio</b> _____</p> <p><b>Mix Developed From:</b></p> <p><b>Density</b>                  Wet _____ pcf      Dry _____ pcf</p> <p><b>Slump</b>                  _____ " (± 1")</p>
--



**B. MIX DESIGN**

**Mix Proportions (per cubic yard)**

	Identification (Type, size, source, etc.)	Weight (pounds)	Density (SSD)	Volume (cubic feet)
Cement				
Fly Ash				
Aggregate #1				
#2				
Water				
<b>TOTALS</b>				

**C. MASONRY SUBCONTRACTOR INFORMATION**

---

<b>Company Name</b>	_____	<b>Tel. #</b>	_____ ( ) _____
<b>Address</b>	_____		
<b>City, ST Zip</b>	_____		
<b>Technical Contact</b>	_____	<b>Cell #</b>	_____ ( ) _____
		<b>e-mail</b>	_____
<b>Sales Contact</b>	_____	<b>Cell #</b>	_____ ( ) _____

## SECTION 04910 – MASONRY RESTORATION AND REPAIR

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Repair, patching, and replacement of damaged or defective concrete masonry units, brick, architectural masonry, and precast sills and caps.
- B. Related Requirements: The following list is intended to aid in locating work related to or dependent on the scope of Work in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
  - 1. Section 01351 – Regulatory Compliance.
  - 2. Section 04200 - Unit Masonry. Masonry materials and installation.
  - 3. Section 09900 – Painting. Existing paint coating removal prior to crack repair and patching.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. Occupational Safety and Health Administration (OSHA):
  - 1. OSHA 1926.1153 Respirable Crystalline Silica.

## 1.3 ENVIRONMENTAL REQUIREMENTS

- A. Minimize dust emissions or provide equipment that suppresses dust.

## 1.2 PROJECT CONDITIONS

- A. Follow cold and hot weather procedures of MSJC.

## PART 2 - PRODUCTS

## 2.1 PERFORMANCE REQUIREMENTS

- A. Provide unit masonry, mortar, and grout conforming to requirements of Section 04200.

## PART 3 - EXECUTION

## 3.1 INSTALLATION – GENERAL

- A. Comply with installation requirements of Section 04200 unless otherwise specified herein.

## 3.2 MASONRY REPAIR

- A. Perform repairs in locations and to the extent as shown on the drawing.
- B. Perform jobsite sawing, grinding, and drilling with tools equipped with an integrated water delivery system that continuously feeds water to the blade or a HEPA-rated filter dust collection vacuum system recommended by the manufacturer to maintain dust emissions below the permissible level.
- C. When removing dust, dirt, and loose or damaged masonry and mortar from cracks or joints before replacing with new material, use a HEPA-rated filter vacuum.

04910-1

- D. Conduct building repairs prior to cleaning and painting as applicable.
- E. Crack Repair – Painted CMU:
1. Verify repair materials are consistent with the exterior coating system to be used.
  2. Cracks less than 1/16": Remove loose or damaged masonry around the crack.
    - a. Install one of the following:
      - 1) [112.74 Concrete & Masonry Patch](#) by [The Sherwin-Williams Company](#).
      - 2) [ElastoMastic 352](#) by [Edison Coatings, Inc.](#)
  3. Cracks less than 1/8": Remove loose or damaged masonry around the crack.
    - a. Install [Elasto-Fill 354](#) by [Edison Coatings, Inc.](#)
  4. Cracks equal to or greater than 1/8":
    - a. Route out the crack with a v-notch or grinding wheel equipped with proper dust control systems as specified herein.
    - b. Install [Dymonic FC](#) by [Tremco](#) or other Type P1 or P3 polyurethane sealant as specified in 07900. Finish sealant to be a minimum of 1/4"W x 1/4"D.
- F. Crack Repair – Integrally Colored CMU:
1. Prepare a test sample panel for color match in an inconspicuous area before making repairs to verify color match. Use test site as basis to verify acceptable appearance for the remainder of the project.
  2. Stable Cracks less than 1/18": Remove loose or damaged masonry around the crack.
    - a. Trowel [Tamms Cement Wash](#) by [Euclid Chemical Company](#) into the cracks in accordance with the manufacturer's instructions.
    - b. After the crack is repaired, apply [Series 617 Conformal Stain WB](#) by [Tnemec](#) to conceal the repair.
  3. Dynamic cracks:
    - a. Route out the joints to a minimum of 1/4 by 1/4 inch to allow for adequate sealant in the joint.
    - b. Apply [Dymeric 240 FC](#) by [Tremco](#) or an equivalent tintable 2-part urethane sealant. Apply without overlap onto surface of CMU.
    - c. Custom match sealant color to CMU color.
- G. Tuck-Pointing - Painted and Integrally Colored CMU:
1. Remove cracked, loose, or missing mortar no deeper than 3/4" until sound mortar is reached. Do not attempt to re-point joints smaller than 8" or smaller than 4" on a vertical architectural masonry joint.
  2. If the wall is coated, remove coating as specified herein. Apply mortar only to bare concrete or bare mortar. Do not apply new mortar to an existing feathered thickness.
  3. If wire reinforcing is exposed in a horizontal masonry joint, grind the exposed wire down until no longer visible. Remove loose material and dust until sound mortar is reached. Prepare joint as specified above.
  4. Mortar: Mortar materials and color shall conform to Section 04200.
  5. Apply new mortar into the joint in layers not exceeding 1/4 inch. Verify thumbprint hardness before applying subsequent layers.
- H. Patching - Masonry and CMU:
1. Remove existing coatings. Apply patching material to bare, sound masonry that does not have scaling or spalled layers.
  2. In the case of iron inclusions, drill the corroded area on the face of the CMU to a maximum depth of 3/4 inch to remove the underlying iron inclusion. Use proper dust control methods as specified herein.
  3. Apply admixture, primer, and patching products as follows:
    - a. Where application of patching material must be a thickness of between 1/8" and 1 1/2":
      - 1) Admixture: [SikaLatex R](#) by [Sika Corporation/Sika USA](#) Sika Corporation.
      - 2) Primer: Scrub coat of [SikaRepair -223](#) or [Sika Armatec -110 EpoCem](#) by Sika.
      - 3) Patching material: [SikaRepair -223](#).
    - b. Where application of patching material must be a thickness of 1/4":
      - 1) Primer: [Duralprep A.C.](#) by Euclid Chemical.
      - 2) Patching material: [Verticoat Supreme](#) by Euclid Chemical.
      - 3) Cure: High solids, water-based compound.
  4. For integrally colored brick face, apply [Series 617 Conformal Stain WB](#) by [Tnemec](#) after the repair material has cured.

- I. Block, Brick, and Block Face Replacement:
  - 1. Replace with units matching adjacent existing units.
  - 2. Chisel or saw out the damaged unit or unit face and surrounding mortar. Remove dust and debris. Use proper dust control tools and methods as specified herein.
  - 3. Butter edges of the new unit with mortar to install.
  
- J. Architectural Masonry (Quick-Brik) Face Replacement:
  - 1. Replace spalled and mismatched units as specified in 04200.
  - 2. Install replacement units in accordance with the moisture control requirements of ASTM C90.
  
- K. Screen Wall Caps - Replacement of Existing Precast Concrete Cap with Metal Coping Assembly:
  - 1. Remove existing precast screen wall caps and anchors. Fill or grind top surface of wall to provide smooth and level surface.
  - 2. Assemble and install sheet metal coping as specified in Section 05500.
  - 3. Do not re-anchor loose precast caps or replace damaged precast caps with new precast caps.
  
- L. Concrete Sill:
  - 1. If joints are not separated or cracked, remove head joint at every third joint in preparation for a soft (control) joint.
  - 2. Remove cracked and separated mortar on the top side and edges of the concrete cap head joints in preparation for installation of a soft joint.
  - 3. Remove all loose debris and prime joint in accordance with sealant manufacturer's instructions.
  - 4. Install a Type P1 or P3 polyurethane sealant as specified in 07900 in the head joint in accordance with manufacturer's instructions.
  - 5. If sills are to receive new paint, apply a cement-based waterproof coating such as ThoroSeal by Master Builders or equivalent.
  - 6. If sills are not to receive paint, apply a water repellent in as specified in 07190.

### 3.3 MASONRY RESTORATION

- A. Architectural Masonry and Integrally Colored Block – Exterior:
  - 1. Determine the method of cleaning by testing in an inconspicuous area to determine best suited methods to minimize the effect of cleaning on color and texture.
  - 2. Protect non-masonry surfaces and other architectural masonry surfaces from contact with cleaning solutions.
  - 3. Avoid aggressive cleaning that will remove non through-body surface coloring.
  - 4. Pressure wash surface to remove efflorescence, oil, grease, paint splatter, and surface contamination. Repair cracks or voids exposed or created during surface preparation as specified herein.
  - 5. Remove lime run and calcite stains using one or both of the following methods:
    - a. Method 1: Apply [NMD 80](#) by [EaCo Chem](#) Inc. Contact: Tom Connelly, (800) 313-8505 diluted as recommended by the manufacturer.
      - 1) Agitate cleaner using a rubbing stone. Do not allow the cleaner to dry on the surface.
      - 2) Rinse with water at low pressure.
      - 3) If a single application does not remove stains, apply a second time before proceeding to Method 2.
    - b. Method 2 (Use only if Method 1 is unsuccessful): Apply [Calcite Presoak](#) by [EaCo Chem](#) according to manufacturer's instruction.
      - 1) Agitate cleaner using a rubbing stone. Do not allow the cleaner to dry on the surface.
      - 2) After the presoak has penetrated, scratch the stains to verify that stains are soft enough to be scratched through.
      - 3) Apply, agitate, and rinse NMD-80 according to manufacturer's instructions.
  - 6. Remove hardened mortar splatters by hand with scrape hoes or chisels. Clean with [Sure Klean Light Duty Concrete Cleaner](#) (formerly [Sure Klean Concrete Brick Cleaner](#)) by [Prosoco, Inc.](#), [NMD 80](#) by [EaCo Chem](#), or equivalent in accordance with manufacturer's instructions.
  - 7. Allow the surface to dry before applying new coatings. Prior to painting, verify dryness by testing in accordance with the manufacturer's instructions and the meter and plastic sheet methods as specified in Part 3 herein.

8. When cleaning process and products are established in the field sample assessment and approved by the manufacturer, follow the same process for cleaning remaining surfaces of same type.

B. Stone Veneer

1. Comply with manufacturer's instructions for cleaning and the following cleaning procedure.
2. General Cleaning of Veneer Units:
  - a. Wash with soft bristle brush and water/granulated detergent solution.
  - b. Rinse immediately with clean water.
3. Efflorescence Removal:
  - a. Allow veneer to dry thoroughly.
  - b. Scrub with soft bristle brush and clean water.
  - c. Rinse immediately with clean water and allow to dry.
  - d. If efflorescence is still visible, repeat the above procedure using a solution of 1 part household vinegar and 5 parts water.
  - e. Rinse immediately with clean water.
  - f. Repeat as necessary to remove the efflorescence.

3.4 CLEANING

- A. In-Progress Cleaning: As the work progresses, clean unit masonry by dry brushing. Before tooling joints, remove mortar fins and smears. Use proper dust control methods for dry cleaning and mortar removal.
- B. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
  1. Remove large mortar particles and excess mortar by hand with wooden paddles and nonmetallic scrape hoes or chisels.
  2. Use non-metallic tools in cleaning operations.
  3. Protect non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
  4. Consult masonry unit manufacturer for acceptable cleaners. Use cleaners intended for use on the type of masonry to which it is applied and which will not harm masonry or adjacent materials.
  5. Clean non-colored CMU masonry with a proprietary acidic cleaner applied according to cleaning product manufacturer's written instructions.
  6. Clean integral colored CMU with a low-acidic proprietary cleaner containing no muriatic acid such as [Enviro Klean Safety Klean](#) or [Sure Klean Light Duty Concrete Cleaner](#) by [Prosoco, Inc.](#), or [NMD 80](#) by [EaCo Chem.](#), applied according to cleaning product manufacturer's written instructions.
  7. Clean architectural masonry with a low-acidic proprietary cleaner containing no muriatic acid such as [Enviro Klean Safety Klean](#) or [Sure Klean Light Duty Concrete Cleaner](#) by [Prosoco, Inc.](#), or [NMD 80](#) by [EaCo Chem.](#), applied according to cleaning product manufacturer's written instructions.
- C. Replace defective mortar. Match adjacent work.
- D. Dispose of construction waste in accordance with the requirements of Section 01351 Regulatory Compliance Supplement.

3.5 PROTECTION

- A. Maintain protective boards at exposed external corners which may be damaged by construction activities.
- B. Provide protection without damaging completed work.

3.6 FIELD QUALITY CONTROL

- A. Field quality control shall be the responsibility of the Contractor in accordance with Section 01452. Field quality control testing and inspection shall be at the discretion of the Contractor as necessary to assure compliance with Contract requirements.

3.7 OWNER TESTING AND INSPECTION (T&I)

04910-4

A. The Owner testing and inspection as specified in Appendix B shall not apply to masonry repair specified herein.

END OF SECTION



**MASONRY GROUT MIX DESIGN SUBMITTAL FORM**  
 (Section 04200 – Unit Masonry Assemblies)

Date \_\_\_\_\_

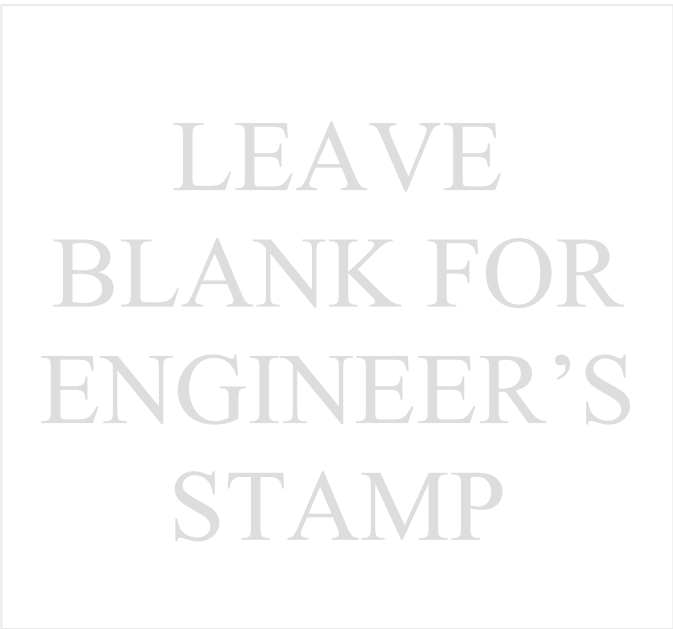
SUPERCENTER  MARKET  SAM'S CLUB

**STORE INFORMATION**

**STORE #** \_\_\_\_\_  
**ADDRESS** \_\_\_\_\_  
**CITY, ST** \_\_\_\_\_  
**GENERAL CONTRACTOR**  
**COMPANY** \_\_\_\_\_  
**JOBSITE PHONE** \_\_\_\_\_

**A. GROUT INFORMATION**

Supplier Mix Design # _____  Design Strength (f'c) _____ psi  Water / Cementitious Ratio _____  <b>Mix Developed From:</b>  <b>Density</b> Wet _____ pcf      Dry _____ pcf  <b>Slump</b> _____ " (± 1")
--



**B. MIX DESIGN**

**Mix Proportions (per cubic yard)**

	Identification (Type, size, source, etc.)	Weight (pounds)	Density (SSD)	Volume (cubic feet)
Cement				
Fly Ash				
Aggregate #1				
#2				
Water				
<b>TOTALS</b>				

**C. MASONRY SUBCONTRACTOR INFORMATION**

---

<b>Company Name</b>	_____	<b>Tel. #</b>	_____ (     ) _____
<b>Address</b>	_____		
<b>City, ST Zip</b>	_____		
<b>Technical Contact</b>	_____	<b>Cell #</b>	_____ (     ) _____
		<b>e-mail</b>	_____
<b>Sales Contact</b>	_____	<b>Cell #</b>	_____ (     ) _____

## SECTION 05090 –CONCRETE AND MASONRY ANCHORS

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Mechanical and adhesive type anchors for detailed structural connections, exterior signage, and exterior prefabricated wall panel assembly.
  - 2. Mechanical type anchors for sales floor merchandise shelving fixtures and storage racks.
  - 3. General use anchors not included in the above.
- B. Related Requirements: The following list is intended to aid in locating work related to or dependent on the scope of Work in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
  - 1. Section 01351 – Regulatory Compliance.
  - 2. Appendix B – Testing, Inspection, and Observation by Owner: Procedures for inspection, testing, and documentation by Owner furnished testing laboratory.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. Occupational Safety and Health Administration (OSHA):
  - 1. OSHA 1926.1153 Respirable Crystalline Silica.

## 1.3 ENVIRONMENTAL REQUIREMENTS

- A. Minimize dust emissions and provide equipment that suppresses dust.
- B. Dispose of construction waste in accordance with the requirements of Section 01351 Regulatory Compliance Supplement.

## 1.2 SUBMITTALS

- A. Code approval reports showing evidence of published performance data for each structural anchor used shall be available for review by the Structural Engineer of Record (SER) or Architect of Record (AOR) upon request. Evidence may be in the form of current ICC-ESR report or UES-ER report, as noted below, or a report by an independent testing laboratory.
- B. Reports not necessary for general use anchors, unless required by AHJ.

## 1.3 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. ASTM International (ASTM):
  - 1. ASTM C 881 - Epoxy-Resin-Based Bonding Systems for Concrete

## 1.4 QUALITY ASSURANCE

- A. Reports showing evidence of published performance data for each anchor used shall be available for review by the

Structural Engineer of Record upon request. Evidence may be in the form of current ICC-ER report or a report by an independent testing laboratory.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Provide products from one of the following manufacturers:
1. [Hilti](#), (800) 879-8000.
  2. [ITW Red Head](#), (800) 848-5611.
  3. [Simpson Strong-Tie Company, Inc.](#) (800) 999-5099
  4. [DeWalt Anchors and Fastening](#) (formerly DeWalt-Powers), (800) 524-3244.

### 2.2 MATERIALS

- A. Substitutions: Substitutions of products from manufacturers not listed are not permitted.
- B. Alternate Products: Alternate products from the manufacturers listed may be used upon approval based upon suitability for the installation involved as determined by the SER.
- C. Provide proprietary anchor products as specified below unless otherwise shown on the drawings or specified in other sections. Anchors may be any one of the products listed for the type specified unless otherwise shown or specified.
- D. Manufacturer's Instructions: Provide complete installation instructions with items furnished to the field.

### 2.3 STRUCTURAL MECHANICAL ANCHORS

- A. Interior Use Anchors: Zinc plated carbon steel anchors.
- B. Exterior Use Anchors: Stainless steel with stainless steel nuts and washers of matching alloy group and minimum proof stress equal to or greater than the specified minimum full-size tensile strength of the externally threaded fastener.
- C. Wedge Expansion Anchors: Torque-controlled, with impact section to prevent thread damage complete with required nuts and washers. Type and size as indicated on Drawings. Provide one of the following:
1. Hilti:
    - a. Kwik Bolt TZ.
      - 1) Concrete (ESR 4266).
      - 2) Grout Filled CMU (ESR 4561).
  2. Simpson:
    - a. Strong-Bolt 2.
      - 1) Concrete (ESR 3037).
      - 2) Grout Filled CMU (ER 240).
  3. ITW Red Head:
    - a. Tru-bolt+.
      - 1) Concrete (ESR 3772).
      - 2) Grout Filled CMU (ESR 4058).
  4. DeWalt:
    - a. Power-Stud+ SD1.
      - 1) Concrete (ESR 2818).
      - 2) Grout Filled CMU (ESR 2966).
- D. Sleeve Anchors: Torque controlled, exhibiting follow-up expansion under load, with provision for rotation prevention during installation. Provide one of the following:
1. Hilti: HLC Sleeve Anchor.
    - a. Exterior signage connection only.

- E. Screw Anchors: Single piece anchor installed in a pre-drilled hole using a bit matching manufacturer tolerances. Anchors shall have 360-degree contact with the base material and shall not require oversized or undersized holes for installation. Type and size as indicated on Drawings. Provide one of the following:
1. Hilti:
    - a. KH-EZ.
      - 1) Concrete (ESR 3027).
      - 2) Grout Filled CMU (ESR 3056).
  2. Simpson:
    - a. Titen HD.
      - 1) Concrete (ESR 2713).
      - 2) Grout Filled CMU (ESR 1056).
  3. ITW Red Head:
    - a. Tapcon.
      - 1) Concrete (ESR 2202).
    - b. Large Diameter Tapcon (LDT).
      - 1) Shelving fixture upright connection only.
  4. DeWalt:
    - a. Screw-Bolt+.
      - 1) Concrete (ESR 3889).
      - 2) Grout Filled CMU (ESR 4042).

#### 2.4 STRUCTURAL ADHESIVE ANCHORS

- A. Adhesive Anchor Bolts: Stud-type anchors consisting of threaded steel rod, nut, and washer or deformed reinforcing bar, and anchor adhesive. Use type and size as indicated on Drawings. Use stainless steel or zinc coated carbon steel for exterior exposure.
- B. Adhesive: Adhesive shall be a cartridge type, two-component, epoxy, acrylic, or hybrid based system dispensed and mixed through a static mixing nozzle supplied by the manufacturer. Acceptable installation and performance temperature ranges shall be verified with manufacturer's literature prior to installation. Provide one of the following:
1. Hilti:
    - a. HIT-HY 200 (A/R).
      - 1) Concrete (ESR 4868).
      - 2) Grout Filled CMU (ESR 4878).
    - b. HIT-HY 270.
      - 1) Hollow and Grout Filled CMU (ESR 4143).
    - c. HIT-RE 500 V3.
      - 1) Concrete (ESR 3814).
  2. Simpson:
    - a. SET-3G.
      - 1) Concrete (ESR 4057).
      - 2) Grout Filled CMU (ESR 4844).
    - b. AT-3G.
      - 1) Concrete (ESR 5026).
  3. ITW Red Head:
    - a. C6+.
      - 1) Concrete (ESR 4046).
    - b. A7+.
      - 1) Concrete (ESR 3903).
      - 2) Grout Filled CMU (ESR 890).
  4. Dewalt:
    - a. AC100+ Gold.
      - 1) Concrete (ESR 2582).
      - 2) Grout Filled CMU (ESR 3200).
    - b. AC200+.
      - 1) Concrete (ESR 4027).

## 2.5 GENERAL USE ANCHORS

- A. General use anchors shall be adequate for the loads they support.
- B. Testing and inspection are not required for general use anchors.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine conditions and adjacent areas where products and materials will be installed and verify that conditions conform to product manufacturer's requirements. Verify that structural components are ready to receive Work. Do not proceed until unsatisfactory conditions have been corrected.
- B. Beginning of installation indicates acceptance of existing conditions.

### 3.2 INSTALLATION

- A. Post-installed anchors installed for missing or misplaced cast-in-place anchors shall be approved by the SER.
- B. Where manufacturer recommends use of special tools for installation of anchors, such tools shall be used, unless otherwise permitted specifically by the SER.
- C. Where holes are drilled in concrete or masonry, provide drills equipped with a HEPA-rated filter vacuum dust collection system recommended by the manufacturer to maintain dust emissions below the permissible level.
- D. Drill holes accurately and squarely. Clean holes in accordance with the manufacturer's recommendations using a HEPA-rated filter vacuum.
- E. Anchor Installation (General):
  - 1. Install anchors where shown on the drawings.
  - 2. Perform anchor installation in accordance with manufacturer instructions. Install anchors at not less than the minimum embedment, edge distance, and spacing recommended by the manufacturer.
  - 3. Drill holes with rotary impact hammer drills using carbide-tipped bits. Drill bits shall be of diameters as specified by the anchor manufacturer. Unless otherwise shown on the Drawings, all holes shall be drilled perpendicular to the base material surface.
    - a. Cored Holes: Where anchors are to be installed in cored holes, use core bits with matched tolerances as specified by the manufacturer.
    - b. Embedded Items: Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Avoid damage to existing reinforcing or embedded items during coring or drilling. Avoid damaging electrical and telecommunications conduit and gas lines. Notify the SER if reinforcing steel or other embedded items are encountered during drilling.
    - c. Base Material Strength: Unless otherwise specified, do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
    - d. Hollow Substrates: Where anchors are noted to be installed in hollow substrates, holes shall be drilled using rotation mode only.
  - 4. Use anchors of the same anchor manufacturer for anchors of the same type.
- F. Mechanical Anchor Installation: Protect threads from damage during anchor installation. Sleeve anchors shall be installed with sleeve fully engaged in part to be fastened. Set anchors to manufacturer's recommended torque, using a torque wrench.
- G. Adhesive Anchor Installation:
  - 1. When the base material temperature drops below 40-degrees F, use only acrylic adhesive or type as suitable per the manufacturer. See manufacturer's instructions for additional minimum temperature requirements. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by

- manufacturer for optimum results. Do not install under environmental conditions outside manufacturer's absolute limits.
2. Hollow Substrates: Anchorage into hollow substrates is not allowed unless specifically indicated on the contract documents. Where applicable, the adhesive manufacturer's screen tubes shall be used for adhesive installation into hollow substrate applications.
  3. Oversized Holes: Refer to manufacturer's information if drilled hole size is larger than what is recommended.
  4. Core Drilled Holes: Refer to manufacturer's information if holes are drilled with a core-drill bit.
  5. Clean holes per manufacturer instructions to remove loose material and drilling dust prior to installation of adhesive. Inject adhesive into holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive. Follow manufacturer recommendations to ensure proper mixing of adhesive components. Sufficient adhesive shall be injected in the hole to ensure that the annular gap is filled to the surface. Remove excess adhesive from the surface. Shim anchors with suitable device to center the anchor in the hole. Do not disturb or load anchors before manufacturer specified cure time has elapsed.

### 3.3 REPAIR OF DEFECTIVE WORK

- A. Remove and replace misplaced, defective, or malfunctioning anchors. Anchors that fail a shear or pullout test, if directed or installation torque requirements shall be regarded as malfunctioning. Fill empty anchor holes and patch failed anchor locations with high-strength non-shrink, nonmetallic grout.

### 3.4 FIELD QUALITY CONTROL

- A. Field quality control shall be the responsibility of the Contractor in accordance with Section 01452. Except as specified as mandatory, field quality control testing and inspection shall be at the discretion of the Contractor as necessary to assure compliance with Contract requirements. Owner T&I specified in Appendix B shall not preclude Contractor responsibility to perform similar routine, necessary, and customary testing and inspection of the methods and frequency suitable for the type of work involved.

### 3.5 OWNER TESTING AND INSPECTION (T&I)

- A. The Owner will perform testing and inspection in accordance with Appendix B (Section 05090).

END OF SECTION

## SECTION 05120 (05 1200) - STRUCTURAL STEEL

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes: Owner will furnish the following for installation by Contractor:
1. Structural steel framing members, structural steel support members, struts, with required bracing, welds, and fasteners.
  2. Base plates and shear stud connectors.
  - 3.
  4. Grout, for setting and anchoring items in masonry and concrete.
  5. Roof framing other than joists, joist girders, and bridging.
  6. Exterior canopy framing other than joists and bridging, including deck bearing support material.
  7. Columns, base plates, and anchor bolts, except items specifically listed in Specification Section 05500.
  8. Vestibule framing tubes, angles, and channels.
  9. Frames for rooftop HVAC units, compressor racks, refrigeration equipment, exhaust fans and roof openings larger than 10 inches by 10 inches (except as shown on Drawings).
  10. Angle for field fabrication of frames for openings larger than 10 inches by 10 inches and not shown and sized on Drawings.
  11. Framing for rooftop refrigeration equipment.
  12. Support plates and angles with anchor studs, sleeve anchors, expansion bolts, or adhesive anchors, which are embedded in, anchored to the face of, or cast into concrete or masonry above finished floor, unless specified as Contractor provided in Specifications Section 05500.
  13. Adhesive anchors including, rods, adhesive cartridges, and mixing tubes.
  14. Anchor bolts, nuts, and washers required for items included in this Section.
  15. Erection bolts, nuts, and washers, including those required for attachment of steel joists and steel joist girders, to items included in this Section.
  16. Joist and joist girder continuity angles.
  17. Accessories specified below except those specified as Contractor provided.
  18. Satellite dish support.
  19. Framing and anchors required for attachment of the EDC as indicated on Structural Drawings.
  20. Shear collector tubes as indicated on Structural Drawings.
  21. Lintel framing as indicated on Structural Drawings.
- B. Related Requirements: The following list is intended to aid in locating work related to or dependent on the scope of Work in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
1. Division 3 - Concrete: Anchorages cast in concrete.
  2. Section 05090 - Post-Installed Concrete and Masonry Anchors: Mechanical and adhesive type anchor studs, expansion bolts, sleeve anchors, adhesive anchors, and anchor bolts embedded in concrete and masonry for anchoring and supporting structural members.
  3. Section 05210 - Steel Joists: Steel bracing for joists and joist girders.
  4. Section 05300 - Metal Deck: Support framing for roof openings.
  5. Section 05500 - Metal Fabrications: Miscellaneous steel components.
  6. Appendix A – Products and Work By Owner or Separate Contractor: Manufacturers, suppliers, product descriptions, and general procedures related to Owner furnished products and work.
  7. Appendix B – Testing, Inspection, and Observation by Owner.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. American Institute of Steel Construction (AISC):

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1. AISC 303 - Code of Standard Practice for Steel Buildings and Bridges.
2. AISC 360 - Structural Steel Buildings.

C. ASTM International (ASTM):

1. ASTM A 36 - Structural Steel.
2. ASTM A 53 - Pipe, Steel, Black and Galvanized, Seamless and Welded.
3. ASTM A 108 - Steel Bars, Carbon And Alloy, Cold- Finished,
4. ASTM A 123 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
5. ASTM A 307 - Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
6. ASTM A 325 - Structural Bolts, Heat Treated, 120/105 ksi Minimum Tensile Strength.
7. ASTM A 490 - Structural Bolts, Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength.
8. ASTM A 500 - Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
9. ASTM A 501 - Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
10. ASTM A 992 - Structural Steel Shapes.
11. ASTM C 1107 - Packaged Dry, Hydraulic-Cement Grout (Non-Shrink).
12. ASTM D 1187 - Asphalt-Base Emulsions for Use as Protective Coatings for Metal.
13. ASTM E 709 - Standard Guide for Magnetic Particle Testing

D. American Welding Society (AWS):

1. AWS D1.1 - Structural Welding Code.
2. AWS D1.3 - Structural Welding Code - Sheet Steel.

E. Research Council on Structural Connections (RCSC):

1. RCSC Specification for Structural Joints Using ASTM A 325 or A 490 Bolts.

F. Steel Structures Painting Council (SSPC):

1. SSPC-SP 2 - Hand Tool Cleaning.
2. SSPC SP-3 – Power Tool Cleaning.

### 1.3 ADMINISTRATIVE REQUIREMENTS

A. Pre-installation Meeting:

1. Convene Pre-installation Meeting at Site one week prior to commencing work of this Section. Require attendance of parties directly affecting work of this Section, including, but not limited to, the Owner's representative, Contractor, steel erector sub-contractor and foreman, and Owner's Construction Testing Laboratory.
2. Notify all attendees at least two weeks prior to the meeting.
3. Review preparation and installation procedures and coordinating and scheduling required with related work.
4. Review foreseeable methods and procedures related to the work, including the following:
  - a. Tour, inspect, and discuss condition of preparatory work performed by other trades.
  - b. Review structural loading limitations and bracing requirements.
  - c. Review drawings, specifications and other contract documents including submittals.
  - d. Review and finalize construction schedule related to work and verify availability of materials, installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  - e. Review required inspections, testing, certifying, and material usage accounting procedures.
  - f. Review weather and forecasted weather conditions, and procedures for coping with unfavorable conditions.
5. Record discussions of the meeting and decisions and agreements (or disagreements) reached, and furnish copy of record to each party attending.

### 1.4 SUBMITTALS

- A. Submittal Procedures: Unless otherwise specified herein, submit in accordance with procedures specified in Section 01330. Submit all submittals electronically in PDF format via email, unless otherwise specified, to Architect of Record.
- B. Shop Drawings: Submit within 10 working days of Contract Date.

1. Indicate profiles, sizes, spacing, and locations of structural members, connections, attachments, and fasteners.
  2. Include supplementary parts and members necessary to complete structural steel work, regardless of whether parts are definitely shown or specified, and furnish bolts, gussets, plates, and related items as required for proper assembly of items.
  3. Include miscellaneous deck support angles as required for proper support of metal deck around columns, gussets, openings, and obstructions.
  4. Indicate welded connections using standard AWS welding symbols. Indicate net weld lengths.
  5. Provide setting drawings, templates, and directions for installation of anchor bolts and other anchorages to be installed by other trades.
  6. Indicate top of bearing plate elevations, and elevations above finish floor to the centerlines of embedded plate, anchor bolts, and all control joint locations.
  7. Templates shall be furnished by fabricator with instructions for setting of anchor bolts and bearing plates.
  8. Prepare shop drawings under seal of a Professional Structural Engineer registered in the State in which Project is located.
  9. Omission from shop drawings of materials required by Contract Documents does not relieve Contractor of responsibility of furnishing and installing such materials even though shop drawings may have been returned and reviewed.
- C. Calculations: Within 10 days of Contract Date, submit design calculations for structural steel connections not detailed on Contract Documents or proposed differently than as shown on Contract Documents, signed and sealed by Professional Structural Engineer registered in State in which Project is located.
- D. Substitutions: Submit substitutions of sections or modifications of details, or both, and reasons for proposal, with shop drawings. Clearly identify substitutions as such. Accepted substitutions, modifications, and necessary changes in related portions of Work shall be coordinated by fabricator and shall be accomplished at no additional cost to Owner.
- E. Contractor's Final Field Use Drawing Review Form: Complete Contractor's Final Field Use Drawing Review Form at the end of this Section and submit to Structural Engineer of Record (SER) and Owner's Structural Steel Supplier.

## 1.5 QUALITY ASSURANCE

- A. Welder Qualifications: Qualify welding operators in accordance with Standard Qualification Procedures as required by AWS D1.1.
- B. Comply with applicable provisions of the following specifications and documents:
1. AISC 303.
  2. AISC 360.
  3. RCSC Specification for Structural Joints Using ASTM A 325 or A 490 Bolts.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Product Delivery: Owner's Structural Steel Supplier will deliver products to Site for Contractor to receive on delivery date established by Contractor. To establish product delivery date, contact the Owner's Account Contact person indicated immediately upon notice of Award of Contract.
- B. Product Packaging: Steel will be shipped with identification markings on each component or package. Identification markings will coordinate with identification markings for components indicated on Structural Steel Supplier setting drawings.
- C. Acceptance at Site:
1. Verify quantity of products furnished with setting drawings and Bills of Lading provided by Structural Steel Supplier.
  2. Report discrepancies in product quantity delivered, or damage to products delivered to Owner and Structural Steel Supplier immediately. Note description of product quantity discrepancies and/or product damage on Bill of Lading. Upon notification, Owner will arrange for delivery of replacement products.

- D. Manufacturing Defects: Report suspected product manufacturing defects to Owner's Construction Manager and Structural Steel Supplier. Upon notification, Owner will arrange for repair of product manufacturing defects.
- E. Transport, handle, store, and protect products in accordance with the requirements of Section 01600.
- F. Store materials to permit easy access for inspection and identification.
- G. Keep steel members off ground by using pallets, platforms, or other supports.
- H. Protect steel members and packaged materials from erosion and deterioration.
  - 1. Store fasteners in a protected place. Clean and relubricate bolts and nuts that become dry or rusty before use.
  - 2. Do not store materials on structure in a manner that might cause distortion or damage members or supporting structures.
  - 3. Remove salt residue from steel members by power spraying when present as a result of salted roads during winter weather transport.

## PART 2 - PRODUCTS

### 2.1 OWNER FURNISHED PRODUCTS

- A. Owner's Structural Steel Supplier, if designated to furnish structural steel components for project, is specified in Appendix A (Section 05120) for installation by Contractor.

### 2.2 ACCESSORY MATERIALS (CONTRACTOR PROVIDED)

- A. Touch-Up Primer: Field applied touch-up primer is specified in Section 09900.
- B. Asphaltic Mastic: Cold-applied asphalt emulsion complying with ASTM D 1187.
- C. Non-Shrink Grout: Pre-mixed non-shrinking, high strength grout, ASTM C 1107, Type A, B, or C; compressive strength of 5,000 psi in 28 days. Provide one of the following products:
  - 1. [NS Grout](#) by [Euclid Chemical](#), Cleveland, OH (800) 321-7628.
  - 2. [MasterFlow 100 General Construction Grout](#) by [BASF Building Systems](#).
  - 3. [Certi-Vex Grout 1000](#) by [Vexcon Chemicals](#), Philadelphia, PA (888) 839-2661.
  - 4. [1107 Advantage Grout](#) by [Dayton Superior](#), Miamisburg, OH (888) 977-9600.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine conditions and adjacent areas where products and materials will be installed and verify that conditions conform to product manufacturer's requirements. Verify elevations of concrete and masonry bearing surfaces and locations of anchorage. Verify that all conditions are ready to receive Work. Do not proceed until unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Supply items required to be cast into concrete or embedded in masonry with setting diagrams.

### 3.3 SURVEY

- A. Employ Professional Engineer or Land Surveyor registered in State in which Project is located, experienced in survey work, to establish permanent bench marks as shown and as necessary for accurate erection of structural steel. Check elevations of concrete and masonry bearing surfaces, and locations of anchor bolts and similar devices, before erection work proceeds, and report discrepancies to Owner's Construction Manager. Do not proceed with erection until corrections have been made, or until compensating adjustments to structural steel work have been agreed upon with Owner.

### 3.4 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.
- B. Make provision for erection loads, and for sufficient temporary bracing to maintain structure safe, plumb, and in true alignment until completion of erection and installation of permanent bracing.
- C. Do not field cut or alter structural members.
- D. Anchor Bolts: Install anchor bolts and other connectors required for securing structural steel to foundations and other in-place work. Furnish templates and other devices as necessary for presetting bolts and other anchors to accurate locations. Provide post-installed anchors in accordance with Section 05090.
- E. Setting Bases and Bearing Plates: Clean concrete and masonry bearing surfaces of bond-reducing materials and roughen to improve bond to surfaces. Clean bottom surfaces of base and bearing plates.
  - 1. Set loose and attached base plates and bearing plates for structural members on adjusting nuts.
  - 2. Tighten anchor bolts after the supported members have been positioned and plumbed.
  - 3. Grout solidly between bearing surfaces and bases of plates. Finish exposed surfaces, protect installed materials, and allow to cure. For proprietary grout materials, comply with manufacturer's installation instructions.
- F. High-strength Bolting: Install high-strength bolts according to RCSC Specification for Structural Joints Using ASTM A 325 or A 490 Bolts for type of bolt and type of joint shown or specified.
- G. Erection Bolts:
  - 1. Comply with ASTM A 307.
  - 2. Hand tighten nut to minimum depth of nut.
- H. Field Welding: Perform field welding in accordance with AWS D1.1 or D1.3, as applicable. After installation, grind sight-exposed field welds smooth.
- I. Touch-up Painting: Immediately after erection, clean exposed field welds, bolted connections, and abraded areas of shop paint and apply touch-up primer to exposed surfaces. Apply by brush or spray to provide a minimum dry film thickness of 2.0 mils.
- J. Protective Coating: Field apply heavy coat of asphaltic mastic bituminous coating to anchor bolts, base plates, and columns below finished floor where shown on the drawings.
- K. Field Painting: Specified in Section 09900.

### 3.5 FIELD QUALITY CONTROL

- A. Field quality control shall be the responsibility of the Contractor in accordance with Section 01452. Field quality control testing and inspection shall be at the discretion of the Contractor as necessary to assure compliance with Contract requirements. Owner T&I specified in Appendix B (Section 05120) shall not preclude Contractor responsibility to perform similar routine, necessary, and customary testing and inspection of the methods and frequency suitable for the type of work involved.

### 3.6 OWNER TESTING AND INSPECTION (T&I)

- A. The Owner will perform testing and inspection as specified in Appendix B (Section 05120).

### 3.7 REPAIRS AND PROTECTION

- A. Touchup Painting: Immediately after erection, clean exposed areas where primer is damaged or missing and paint with the same material as used for shop painting for touching up shop-painted surfaces.

B. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.

3.8 CLEANING

A. Clean exposed surfaces of primed or painted erected teel to remove stains, dust, dirt, grease, oil, and other surface contaminants.

END OF SECTION

SECTION 05120

**STRUCTURAL STEEL  
CONTRACTOR'S FINAL FIELD USE DRAWING REVIEW**

Project Name: \_\_\_\_\_ Project Number: \_\_\_\_\_

The Contractor shall perform no portion of the Work until review of the Final Field Use Drawings is complete.

By signing below as approved, the Contractor hereby certifies that he has reviewed the Final Field Use Drawings and has checked and coordinated the information contained therein with related work and has reported any errors, inconsistencies, or omissions to the Engineer.

The Engineer's review of this form or any attached drawings shall neither relieve the Contractor or the Structural Steel Supplier from the responsibility to comply with the requirements of the Contract Documents nor approve any work not complying therewith. Final Field Use Drawings are not Contract Documents and do not modify Contract Documents. The Contractor shall be responsible for the accuracy of measurements, elevations, line, and grades of the Work.

**SUBMITTAL:**

Structural Steel Final Field Use drawings from Owner's Structural Steel Supplier dated \_\_\_\_\_  
(check the appropriate submittal action and fill in date on drawings)

Approved / no exceptions taken

Revise and resubmit

Approved / comments attached

Rejected

If comments are required, attach a separate sheet.

Approved by Contractor:

Firm Name: \_\_\_\_\_

Signed by: \_\_\_\_\_ Date: \_\_\_\_\_

Email to Structural Engineer Owner's Structural Steel Supplier.

END OF FORM

## SECTION 05210 (05 2100) - STEEL JOISTS

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes: Owner will furnish the following for installation by Contractor:
1. Open web steel joists, with extended ends, and attached bearing plates.
  2. Joist girders.
  3. Bridging and connection angles for bridging at side walls.
- B. Related Requirements: The following list is intended to aid in locating work related to or dependent on the scope of Work in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
1. Division 3 - Concrete: Grouting base plates and bearing plates.
  2. Section 04200 - Unit Masonry Assemblies: Embedment of bearing plates.
  3. Section 05090 - Concrete and Masonry Post Installed Anchors. Mechanical and adhesive type anchor studs, expansion bolts, sleeve anchors, adhesive anchors, and anchor bolts embedded in concrete and masonry for anchoring and supporting steel joists and joist girders.
  4. Section 05120 - Structural Steel:
    - a. Support plates and angles.
    - b. Bolts, nuts, and washers for attachment of steel joists to structural steel.
    - c. Frames for rooftop HVAC units and roof openings larger than 10 inches by 10 inches.
  5. Section 09900 - Paint and Coatings: Field painting of exposed joists and roof deck.
  6. Appendix A – Products and Work By Owner or Separate Contractor: Manufacturers, suppliers, product descriptions, and general procedures related to Owner furnished products and work
  7. Appendix B – Testing, Inspection, and Observation by Owner.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. American Institute of Steel Construction (AISC):
1. AISC 303 - Code of Standard Practice for Steel Buildings and Bridges.
- C. ASTM International (ASTM):
1. ASTM A 36 - Structural Steel.
  2. ASTM A 242 - High-Strength Low-Alloy Structural Steel.
  3. ASTM A 570 - Steel, Sheet and Strip, Carbon, Hot-Rolled, Structural Quality.
  4. ASTM A 572 - High-Strength Low-Alloy Columbium-Vanadium Steels of Structural Quality.
  5. ASTM E 709 - Standard Guide for Magnetic Particle Testing
- D. American Welding Society (AWS):
1. AWS D1.1 - Structural Welding Code.
- E. Research Council on Structural Connections (RCSC):
1. RCSC Specification for Structural Joints Using ASTM A 325 or A 490 Bolts.
- F. Steel Joist Institute (SJI):
1. SJI Standard Specifications, Load Tables & Weight Tables for Steel Joist & Joist Girders
- G. Steel Structures Painting Council (SSPC):
1. SSPC-SP 2 – Hand Tool Cleaning.

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2. SSPC-SP 3 – Power Tool Cleaning.
3. SSPC Paint 15 - Steel Joist Shop Primer/Metal Building Primer.

### 1.3 SUBMITTALS

- A. Submittal Procedures: Unless otherwise specified herein, submit in accordance with procedures specified in Section 01330. Submit all submittals electronically in PDF format via email, unless otherwise specified herein.
- B. Shop Drawings:
  1. Owner's steel joist supplier will prepare shop drawings and forward via email to the Structural Engineer of Record specified in Section 01330. The Structural Engineer of Record will review the shop drawings and forward stamped electronic documents to the Owner's supplier via email. The Owner's supplier will then forward one approved hard copy to the Contractor.
  2. Shop Drawings will indicate:
    - a. Standard designations, configuration, sizes, spacing, and locations of joists and joist girders.
    - b. Joist and joist girder loading.
    - c. Bridging, connections, attachments, and cambers.
  3. Shop drawings will be prepared under the direction of a Professional Structural Engineer registered in State in which the Project is located.
  4. Shop Drawings will be submitted within 3 working days of Contract date.
- C. Qualification Data: Submit Fabricator qualifications to Architect of Record.
- D. Contractor's Final Field Use Review Form: Complete attached Contractor's Final Field Use Review Form and submit to Structural Engineer of Record identified in Section 01330 and Owner's Steel Joist Supplier specified herein.

### 1.4 QUALITY ASSURANCE

- A. Fabricator Qualifications: Verify fabricator is certified by SJI to manufacture joists complying with applicable standard specifications and load tables of SJI "Specifications."
- B. Qualifications for Welding Work: Qualify welding operators in accordance with Standard Qualification Procedures as required by AWS D1.1.

### 1.5 DELIVERY, STORAGE AND HANDLING

- A. Product Delivery: Owner's Steel Joist Supplier will deliver products to jobsite for Contractor to receive on delivery date established by contractor. To establish product delivery date, contact the Account Contact person indicated, immediately upon notice of Award of Contract.
- B. Project Packaging: Steel Joists will be shipped in manufacturer's standard packaging with identification markings on each component or package. Identification markings will coordinate with identification markings for components indicated on Owner's Steel Joist Supplier installation shop drawings.
- C. Acceptance at Site: Receive products as specified in Appendix A.
  1. Verify quantity of products furnished with Installation Shop Drawings and Bills of Lading provided by Owner's Steel Joist Supplier.
  2. Report discrepancies in product quantity delivered, or damage to products delivered to Owner immediately. Upon notification, Owner will arrange for delivery of replacement products. Note description of product quality discrepancies and/or product damage on Bill of Lading.
- D. Manufacturing Defects: Report suspected product manufacturing defects to Owner's Construction Manager and Owner's Steel Joist Supplier. Upon notification, Owner will arrange for repair of manufacturing defects.
- E. Transport, handle, store, and protect products in accordance with the requirements of Section 01600 and SJI.

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- F. Store materials to permit easy access for inspection and identification.
- G. Keep joist members off ground by using pallets, platforms, or other supports.
- H. Protect members and packaged materials from erosion and deterioration.
  - 1. Store fasteners in a protected place. Clean and relubricate bolts and nuts that become dry or rusty before use.
  - 2. Do not store materials on structure in a manner that might cause distortion or damage members or supporting structures.
  - 3. Remove salt residue from joist members by power spraying when present as a result of salted roads during winter weather transport.

## PART 2 - PRODUCTS

### 2.1 OWNER FURNISHED PRODUCTS

- A. Owner's Steel Joist Supplier will furnish steel joists, joist girders, and bridging as specified in Appendix A for installation by the Contractor. Accessories specified herein are by Contractor.

### 2.2 ACCESSORIES (CONTRACTOR PROVIDED)

- A. Anchors and Fasteners: Provide anchors and fasteners required for installation and attachment of joist, joist girders, and bridging not provided by Owner's Steel Joist Supplier.
  - 1. Generally, Owner's Steel Joist Supplier includes in its package erection fasteners intended to join joists to joists or joists to girders.
  - 2. Fasteners required for connecting joists and girders to other building elements or to structure are generally by Contractor.
- B. Welding Materials: AWS D1.1.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine conditions and adjacent areas where products and materials will be installed and verify that conditions conform to product manufacturer's requirements. Verify that steel joist supporting framing components are ready to receive Work. Do not proceed until unsatisfactory conditions have been corrected.

### 3.2 ERECTION

- A. Erect steel joists, joist girders, and bridging in accordance with approved final field use drawings and SJI Standard Specifications.
- B. Position joists and joist girders on supports in accordance with approved final field use drawings and SJI. During erection, provide temporary bracing, as required by joist manufacturer for induced loads and stresses on joists and joist girders.
- C. Limit sweep of joists to span length/180 or a maximum of 2 inches.
- D. Coordinate placement of anchorages in concrete and masonry construction for making connections to joists and joist girders, and for securing bearing plates. Concrete and masonry post installed anchors are specified in Section 05090.
- E. Connect or field weld joist seat to placed bearing plates after alignment, positioning after installation of bridging. Do not permit erection of decking until joists are braced and bridged.
- F. Do not field cut or alter joists without written approval from Structural Engineer of Record and Owner's Steel Joist

Supplier.

- G. Perform field welding in accordance with AWS D1.1 or D1.3, as applicable. After installation, grind sight-exposed field welds smooth.

### 3.3 FIELD QUALITY CONTROL

- A. Field quality control shall be the responsibility of the Contractor in accordance with Section 01452. Field quality control testing and inspection shall be at the discretion of the Contractor as necessary to assure compliance with Contract requirements. Owner T&I specified in Appendix B (Section 05120) shall not preclude Contractor responsibility to perform similar routine, necessary, and customary testing and inspection of the methods and frequency suitable for the type of work involved.

### 3.4 OWNER TESTING AND INSPECTION (T&I)

- A. The Owner will perform testing and inspection as specified in Appendix B (Section 05120).

### 3.5 PROTECTION

- A. Preparation for Repair Painting: Promptly after installation, clean and prepare rust spots, welds, and abraded surfaces of prime-painted joists and accessories with hand tools according to SSPC-SP 2, or power tools according to SSPC-SP 3.
- B. Final Cleaning:
  - 1. Thoroughly wet wipe or wash exposed surfaces of erected members to remove stains, dust, dirt, grease, oil, and other surface contaminants accumulated during storage or after installation.
  - 2. Do not proceed with repair painting until exposed surfaces are free of dirt and contaminants.
  - 3. Where overhead structure is to receive dryfall system as specified in Section 09900, maintain exposed surfaces of prime-painted members free of stains, dust, dirt, grease, oil, and other contaminants until dryfall work is complete.
- A. Touchup Painting: Apply a compatible primer of same type and color as primer used on adjacent surfaces.

END OF SECTION

**SECTION 05210  
STEEL JOISTS  
CONTRACTOR'S FINAL FIELD USE DRAWING REVIEW**

Project Name: \_\_\_\_\_ Project Number: \_\_\_\_\_

The Contractor shall perform no portion of the Work until review of the Final Field Use Drawings is complete.

By signing below as approved, the Contractor hereby certifies that the he has reviewed the Final Field Use Drawings and has checked and coordinated the information contained therein with related work and has reported any errors, inconsistencies, or omissions to the Architect/Engineer.

The Architect/Engineer's review of this form or any attached drawings shall neither relieve the Contractor or the steel joist supplier from the responsibility to comply with the requirements of the Contract Documents nor approve any work not complying therewith. Final Field Use Drawings are not Contract Documents and do not modify Contract Documents. The Contractor shall be responsible for the accuracy of measurements, elevations, line and grades of the Work.

**SUBMITTAL:**

Steel Joist Final Field Use Drawings from Owner's Steel Joist Supplier dated \_\_\_\_\_  
(check the appropriate submittal action and fill in date on drawings)

Approved / no exceptions taken

Revise and resubmit

Approved / comments attached

Rejected

If comments are required, attach a separate sheet.

Approved by Contractor:

Firm Name: \_\_\_\_\_

Signed by: \_\_\_\_\_ Date: \_\_\_\_\_

Email to Structural Engineer of Record and Owner's Steel Joist Supplier.

END OF FORM

## SECTION 05300 - METAL DECK

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes: Owner furnished items as follows, for installation by Contractor.
1. Metal roof deck.
  2. Sidelap fasteners.
  3. Framed openings up to 10 inches by 10 inches.
  4. Metal canopy deck.
  5. Sloped metal roof deck.
  6. Owner furnished metal form floor deck and accessories.
  7. Contractor installation of metal decking and accessories.
- B. Related Requirement:
1. Section 05090 – Concrete and Masonry Post Installed Anchors. Mechanical and adhesive type anchor studs, expansion bolts, sleeve anchors, adhesive anchors, and anchor bolts embedded in concrete and masonry for anchoring and supporting steel deck.
  2. Section 04200 - Unit Masonry Assemblies: Anchorages for support plates and angles embedded in masonry.
  3. Section 05120 - Structural Steel:
    - a. Structural steel for rooftop HVAC units and framed openings larger than 10 inches by 10 inches.
    - b. Support plates and angles.
  4. Section 05210 - Steel Joists: Support structure for metal decking.
  5. Section 09900 - Paints and Coatings: Field painting of exposed deck.
  6. Appendix A – Products and Work By Owner or Separate Contractor: Manufacturers, suppliers, vendor information, and product data related to Owner furnished products, equipment, and installation.
  7. Appendix B - Testing, Inspection, and Observation by Owner.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. American Iron and Steel Institute (AISI): Specification for the Design of Cold-Formed Steel Structural Members.
- C. ASTM International (ASTM):
1. ASTM A 653 - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  2. ASTM A 1008 - Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.
- D. American Welding Society (AWS):
1. AWS D1.1 - Structural Welding Code.
  2. AWS D1.3 - Structural Welding Code - Sheet Steel.
- E. Steel Deck Institute (SDI):
1. ANSI/SDI-RD Standard for Steel Roof Deck (SDI Standard).
  2. ANSI/SDI-NC Standard for Non-Composite Steel Floor Deck (SDI Standard).
  3. ANSI/SDI-C Standard for Composite Steel Floor Deck (SDI Standard).
- F. Steel Structures Painting Council (SSPC):
1. SSPC-Paint 20 Type II - Zinc Rich Primers - Organic.
  2. SSPC-Paint 25 - Red Iron Oxide, Zinc Oxide, Raw Linseed Oil, and Alkyd Primer.

05300-1

### 1.3 SUBMITTALS

- A. Submittal Procedures: Unless otherwise specified herein, submit in accordance with procedures specified in Section 01330. Submit all submittals electronically in PDF format via email, unless otherwise specified, to Architect of Record.
- B. Shop Drawings:
  - 1. Owner's metal deck Supplier will prepare shop drawings and forward via e-mail to Structural Engineer of Record specified in Section 01330. Remaining Submittal requirements for Owner's metal deck supplier are specified in Appendix A (Section 05300).
- C. Final Field Use Drawing Review Form: Complete attached Final Field Use Drawing Review Form and forward to Structural Engineer of Record Specified in Section 01330 and Owner's metal deck Supplier.
- D. Submit Contractor's Final Field Use Drawing Review Form within 3 working days of Contract date.

### 1.4 QUALITY ASSURANCE

- A. Qualifications for Welding Work: Qualify welding operators in accordance with Standard Qualification Procedures as required by AWS D1.1.
- B. Installer Qualifications: Powder and air actuated fasteners shall be installed by a tool operator licensed by the pin manufacturer.

### 1.5 DELIVERY, STORAGE AND HANDLING

- A. Owner's Supplier will deliver Owner furnished products to site to be received by Contractor as specified in Section 01600.
- B. Project Packaging: Metal decking will be shipped in manufacturer's standard packaging with identification markings on each component or package. Identification markings will coordinate with identification markings for components indicated on Owner's Metal Deck Supplier installation final field use drawings.
- C. Receive and accept owner furnished products and report suspected defects and discrepancies in compliance with the requirements of Section 01600.
- D. Transport, handle, store, and protect products in compliance with the requirements of Section 01600.
- E. Keep materials dry. Separate sheets and store deck on dry wood sleepers; slope for positive drainage.
- F. Prevent damage to edges, ends and surfaces.

## PART 2 - PRODUCTS

### 2.1 OWNER FURNISHED PRODUCTS

- A. Owner's Supplier will furnish steel deck and side lap fasteners as specified in Appendix A (Section 05300) for installation by Contractor.
- B. Contractor's Responsibilities:
  - 1. Furnish and install cover plates and accessories, including bolts and fasteners, required for installation and attachment of deck to structural steel members.
  - 2. Installation of Owner furnished metal decking and accessories.

### 2.2 METAL DECK MATERIALS

a.

05300-2

2. Primer Color: Grey primer top and bottom sides.

- B. Metal Floor Form Deck: G60 zinc coating steel sheet in accordance with SDI standards; ASTM A 653, Classification SS (Structural Steel) or other structural sheet steel or high strength low alloy steel in accordance with SDI standards.
1. Form deck type as shown on Structural Drawings, grade:
    - a. 28, 26, 24 and 22 gage: Grade 60 (60 ksi) minimum
  2. Primer Color: Grey primer bottom side.

## 2.3 ACCESSORIES

- A. Side Lap Fasteners: As noted in the Fastener Schedule shown on the Structural Drawings by one of the following suppliers.
1. Self-drilling, self-tapping screws by [ITW Buildex](#), Itaska, IL (800) 323-0720.
  2. Self-drilling, self-tapping screws by [Elco Construction Products](#), Towson, MD (800) 435-7213.
  3. Self-drilling, self-tapping screws by [Hilti](#), Tulsa, OK (800) 879-8000.
  4. Self-drilling, self-tapping screws by [Simpson Strong Tie](#), Pleasanton, CA (800) 999-5099.
- B. Welding Materials: AWS D1.1.
- C. Primers For Field Touch-Up:
1. For shop applied primer: SSPC 25.
  2. For galvanized surfaces: SSPC 20.
- D. Screw Support Fasteners: Fasteners as noted in the Fastener Schedule shown on the Structural Drawings. Provide the following or Owner approved substitute:
1. Self-drilling, self tapping No. 12 HWH3 Kwik-Seal Fasteners by Hilti, Tulsa, OK (800) 879-8000
  2. Self-drilling, self tapping No. 12 HWH Tek screws, by ITW Buildex, Itaska, IL (800) 323-0720.
  3. Self-drilling, self tapping No. 12 IHWH Dril-Flex screws, by Elco Construction Products, Towson, MD (800) 435-7213.
  4. Self-drilling, self tapping No. 12 HWH X metal screws, by Simpson Strong Tie, Pleasanton, CA (800) 999-5099.
- E. High Capacity Screw Support Fasteners: Fasteners as noted in the Fastener Schedule shown on the Structural Drawings. Provide the following or Owner approved substitute:
1. Self-drilling, self tapping No. 12 Strong Drive XL large head metal screws, by [Simpson Strong Tie](#), Pleasanton, CA (800) 999-5099.
- F. Powder Actuated or Air Actuated Support Fasteners: Fasteners as noted in the Fastener Schedule shown on the Structural Drawings. Provide the following or Owner approved substitute:
1. X-HSN 24 or X-ENP 19 Powder Actuated Fasteners by Hilti, Tulsa, OK (800) 879-8000
  2. SDK-61075, SDK-63075 or K66062 Air Actuated Fasteners by Pneutek, Inc., Hudson, NH (800) 431-8665.
- G. Masonry Anchorage: Specified in Section 04200.
- H. Premolded Closure Strips: Manufactured panel manufacturer's standard, size and configuration to match panel flutes.
- I. Flashing and Counter Flashing: Specified in Section 07620.
- J. Gutters and Downspouts: Specified in Section 07711.
- K. Zinc-Rich Primer: SSPC-Paint 20 Type II.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

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- A. Examine conditions and adjacent areas where products and materials will be installed and verify that conditions conform to product manufacturer's requirements. Verify that metal deck supporting framing components are ready to receive Work. Do not proceed until unsatisfactory conditions have been corrected.
- B. Beginning of installation indicates acceptance of existing conditions.

### 3.2 INSTALLATION

- A. Interface with Other Work:
  - 1. Coordinate locations and sizes of openings for skylights, smoke vents (if specified), roof top mechanical equipment and penetrations of metal deck.
  - 2. Verify steel joist spacing, bracing, and layout.
  - 3. Coordinate structural steel support framing for metal deck openings.
- B. Erect metal decking and connect to structure in accordance with SDI standards. Coordinate attachment sequence and procedure with placing of units; show on final field use drawings.
- C. On steel support members provide 1-1/2 inch minimum bearing. On masonry support surfaces provide 3 inch minimum bearing.
- D. Align and level deck on supports.
- E. Attach welds, fasteners, and side lap connectors of size, spacing, and location as indicated on Drawings.
- F. Install Hilti powder actuated fasteners using the DX 860HSN, DX 460SM, DX 860ENP, or DX-76 tools, by Hilti. Installed pin height shall be in accordance with manufacturer's recommendations, and verified with manufacturer approved inspection gage. Determine power level by jobsite testing.
- G. Install Pneutek air actuated fasteners using decking system, by Pneutek. Install pins in accordance with manufacturer's recommendations. Pin head shall clamp deck tightly to supporting member without gaps between underside of head and top side of deck. Pin shall not cause excessive dimpling of the deck greater than 1/2 the thickness of the pin head.
- H. Welding: In accordance with AWS D1.1 and D1.3. Provide welding washers when welding 24 gauge or lighter steel in conformance with SDI standards. Install 6 inch wide sheet steel cover plates where deck changes direction. Spot weld in place 12 inches on center maximum. Install sheet steel closures and angle flashings to close openings between deck and walls, columns, and openings.
- I. Immediately after welding deck in place, touch-up welds, burned areas, and surface coating damage with prime paint.
- J. Field Painting: Field paint finish as shown on the drawings and as specified in Section 09900.
- K. Metal Canopy Deck:
  - 1. Install panels such that panel joint occurs at top of rib.
  - 2. Coordinate with work of other Sections to produce watertight assembly, capable of withstanding loading pressures and thermal and lateral loads.
  - 3. Install gutter and downspouts furnished under other Sections.
  - 4. Lap panels, set into sealant, and fasten at spacing indicated on Drawings.
  - 5. Coat welded connections with zinc-rich primer complying with SSPC-Paint 20.
  - 6. Isolate metals from dissimilar metals or corrosive substrates using bituminous coating.
  - 7. Fill space between metal panel and support beam and between metal panel and light fixtures with premolded closure accessory strip to eliminate nesting space for birds.
  - 8. Field Finish: Paint canopy supports, structural steel, metal fabrications and accessories on tops, bottoms, edges, and other weather-exposed surfaces as indicated on Drawings, in accordance with Section 09900.

### 3.3 FIELD QUALITY CONTROL

- A. Field quality control shall be the responsibility of the Contractor in accordance with Section 01452. Except as specified as mandatory, field quality control testing and inspection shall be at the discretion of the Contractor as necessary to assure compliance with Contract requirements. Owner T&I specified in Appendix B shall not preclude Contractor's responsibility to perform similar routine, necessary, and customary testing and inspection of the methods and frequency suitable for the type of work involved.
- B. Manufacturer's Field Services: Powder and air actuated fasteners.
  - 1. Inspection: Manufacturer's representative (not a distributor or agent) shall be on site to inspect and verify proper installation of 100% of fasteners.
  - 2. Report: Manufacturer representative (not a distributor or agent) shall submit inspection report indicating verification to Owner's Construction Manager.

### 3.4 OWNER TESTING AND INSPECTION (T&I)

- A. The Owner will perform testing and inspection (T&I) as specified in Appendix B (Section 05300).

END OF SECTION



**SECTION 05300  
METAL DECK  
CONTRACTOR'S FINAL FIELD USE DRAWING REVIEW**

Project Name: \_\_\_\_\_

Project Number: \_\_\_\_\_

The Contractor shall perform no portion of the Work until review of the Final Field Use Drawings is complete.

By signing below as approved, the Contractor hereby certifies that he has reviewed the Final Field Use Drawings and has checked and coordinated the information contained therein with related work and has reported any errors, inconsistencies, or omissions to the Architect/Engineer.

The Architect/Engineer's review of this form or any attached drawings shall neither relieve the Contractor or the steel deck supplier from the responsibility to comply with the requirements of the Contract Documents nor approve any work not complying therewith. Final Field Use Drawings are not Contract Documents and do not modify Contract Documents. The Contractor shall be responsible for the accuracy of measurements, elevations, line and grades of the Work.

**SUBMITTAL:**

Steel Deck Final Field Use drawings from Owners Metal Deck Supplier dated \_\_\_\_\_  
(check the appropriate submittal action and fill in date on drawings)

Approved / no exceptions taken

Revise and resubmit

Approved / comments attached

Rejected

If comments are required, attach a separate sheet.

Approved by Contractor:

Firm Name: \_\_\_\_\_

Signed by: \_\_\_\_\_

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

Return email copy to the Structural Engineer of Record, and one copy to Owner's Metal Deck Supplier.

END OF FORM

## SECTION 05400 - COLD FORMED METAL FRAMING

## PART 1 GENERAL

## 1.1 SUMMARY

## A. Section Includes:

1. Load bearing formed steel stud exterior and interior framing 20 gage and heavier.

## B. Related Requirements:

1. Section 05090 - Post-installed Concrete and Masonry Anchors: Mechanical and adhesive anchors drilled into concrete or masonry.
2. Section 05120 - Structural Steel: Connecting to structural building framing.
3. Section 05210 - Steel Joists: Connecting to steel joists.
4. Section 05300 - Metal Deck: Connecting to decking.
5. Section 06100 - Rough Carpentry: Wood furring strips, plywood, and blocking.
6. Section 07210 - Building Insulation: Thermal insulation installed in exterior framing.
7. Section 09250 - Gypsum Board: Non-load bearing steel stud partition framing lighter than 20 gage.
8. Appendix B – Testing, Inspection and Observation by Owner: Procedures for inspection, testing, and documentation by Owner furnished testing laboratory.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.

## B. American Iron and Steel Institute (AISI):

1. North American Specification for the Design of Cold-Formed Steel Structural Members.
2. Standard for Cold-Formed Steel Framing

## C. ASTM International (ASTM):

1. ASTM A 36 - Carbon Structural Steel.
2. ASTM A 123 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
3. ASTM A 1003 - Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members
4. ASTM C 955 – Standard Specification for Cold Formed Steel Structural Framing Members.
5. ASTM C 1007 - Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories.
6. ASTM C 1513 - Steel Tapping Screws for Cold-Formed Steel Framing Connections.

## D. American Welding Society (AWS):

1. AWS D1.1 - Structural Welding Code - Steel.
2. AWS D1.3 - Structural Welding Code - Steel Sheet.

## E. Gypsum Association (GA):

1. GA-216 - Application and Finishing of Gypsum Board.

## F. Steel Structures Painting Council (SSPC):

1. SSPC-Paint 20 Type I - Zinc Rich Primers - Inorganic.

## G. Steel Framing Industry Association (SFIA):

1. Member listing.

## H. Steel Stud Manufacturers Association (SSMA):

1. SSMA Product Technical Information.

## 1.3 QUALITY ASSURANCE

05400-1

- A. Installer Qualifications: Company specializing in the installation of cold formed metal framing components with minimum five years documented experience.
- B. Qualifications for Welding Work: Qualify welding operators in accordance with Standard Qualification Procedures as required by AWS D1.1.

#### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Transport, handle, store, and protect products in compliance with the requirements of Section 01600.
- B. Protect metal framing from corrosion, deformation, and other damage during delivery, storage, and handling.
- C. Store and protect metal framing products with waterproof covering; ventilate to avoid condensation.
- D. Where framing is stored outdoors, stack materials off ground, supported on level platform, fully protected from weather.

### PART 2 PRODUCTS

#### 2.1 MATERIALS

- A. Comply with AISI North American Specification for the Design of Cold-Formed Steel Structural Members and AISI Standard for Cold-Formed Steel Framing.
- B. Steel Sheet: ASTM A 1003, Structural Grade, Type H, metallic coated, Grade: ST33H (33 ksi) unless otherwise indicated, Coating CP 60: G60 (Z180), A60 (ZF180), AZ50 (AZM150), or GF30 (ZGF90).
- C. Material Thickness: Gage shown on the drawings shall have the following minimum base metal thickness.
  - 1. 20 gage: 33 mils
  - 2. 18 gage: 43 mils
  - 3. 16 gage: 54 mils

#### 2.2 FRAMING AND ACCESSORIES

- A. Manufacturer: Subject to compliance with requirements, provide products of one of the following:
  - 1. [ClarkDietrich](#), West Chester, OH (513) 870-1100.
  - 2. [The Steel Network](#), Durham, NC (888) 474-4876.
  - 3. [Cemco Steel](#), Ft. Worth, TX (817) 568-1525.
  - 4. [Telling Industries, LLC](#) Willoughby, OH (866) 372-6384.
  - 5. [Marino/WARE, South Plainfield, NJ \(800\) 627-4661](#).
  - 6. Other manufacturers listed as members of SSMA, or SFIA.
- B. Interior and Exterior Load-Bearing Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, depth, flange width, and gage as indicated on Drawings.
- C. Interior and Exterior Load-Bearing Steel Joists: Manufacturer's standard C-shaped steel joists, of web depths indicated, with stiffened flanges.
- D. Partition Floor Tracks and Runners: Galvanized sheet steel, C-shaped; same depth and gage as studs; tight fit; solid web.
- E. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and same minimum base-metal thickness as steel studs.
- F. Deflection (Capture) Track: Deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth as shown to contain studs while allowing free vertical movement, with flanges or legs as shown designed to support horizontal and lateral loads. Provide fasteners as indicated on Drawings.

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1. Contractor's Option: Manufacturer's standard double or single deflection track as follows:
  - a. VertiClip or VertiTrack by The Steel Network, Raleigh, NC (888) 474-4876. If this option is used, track may be 20 gage for all stud sizes.
  - b. FastTop Clip by ClarkDietrich, West Chester, OH (513) 870-1100.
  - c. Comparable deflection tracks by other manufacturers listed as members of SSMA, or SFIA.
  
- G. Slotted Deflection Track: Manufacturer's single, deep-leg, U-shaped steel track; punched with vertical slots in both legs. Studs should be positively attached to deep-leg track using vertical slots while allowing free vertical movement. Legs designed to support horizontal and lateral loads and transfer them to the primary structure, as follows:
  1. Contractor's Option: Manufacturer's standard double or single deflection track as follows:
    - a. MaxTrak or BlazeFrame by ClarkDietrich.
    - b. SLP-TRK by Brady Innovations as distributed by Cemco.
    - c. Comparable deflection tracks by other manufacturers listed as members of SSMA, or SFIA.
  
- H. Load-Bearing Wall Furring and Partition Bracing: Galvanized sheet steel.
  1. Cold-Formed Channels: 3/4 inch x 1/2 inch and 1-1/2 inch x 17/32 inch or as shown on the drawings.
  2. Clip Angles: 2 inches x 2 inches x 16 gage x 1/4 inch less than stud width or
    - a. Bridge Clip by The Steel Network.
    - b. EasyClip U-Series Clip Angles 1-1/2" x 1-1/2" x 16 gage x 1/4 inch less than stud width by ClarkDietrich.
    - c. FastBridge Clip (FB) by ClarkDietrich.
  3. Contractor's Option: In lieu of cold-formed channels and clip angles for horizontal bridging, provide one of the following:
    - a. Bridge Bar by the Steel Network.
    - b. TradeReady Spazzer 5400 spacing bar by ClarkDietrich.
  
- I. Steel Shapes and Clips: ASTM A 36, zinc coated by hot-dip process according to ASTM A 123.
  
- J. Framing Attachment Angles: Galvanized sheet steel, size, shape and configuration as indicated on Drawings, 14 gage, unless indicated otherwise on Drawings.
  1. Contractor's Option: Contact ClarkDietrich Clip Express (866) 638-1908 for alternative selections.
  
- K. Ceiling Joists and Runners: Galvanized sheet steel, C-shaped.
  
- L. Flat Metal Straps and Backing Plates: Galvanized sheet steel, gage, shape, and configuration as indicated on Drawings.
  1. Contractor's Option: In lieu of 2-inch continuous metal strap at capture tracks, Contractor may provide one of the following:
    - a. Bridge Bar by The Steel Network.
    - b. TradeReady Spazzer 5400 bridging and spacing bar by ClarkDietrich.

## 2.3 FASTENERS

- A. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 10 times design load.
- B. Mechanical Fasteners: ASTM C 1513, corrosion-resistant-coated, self-drilling, self-tapping steel drill screws.
- C. Framing to Framing: ASTM C 1513; 5/8 inch Type S-12 low-profile head corrosion-resistant self-drilling self-tapping steel screws.
- D. Framing to Attachment Angle Fasteners: #12 diameter pan head corrosion-resistant self-drilling self-tapping steel screws.
- E. Wall Floor Track Anchorage Device: Carbon steel wedge type expansion anchor; minimum 3/8 inch diameter x minimum 1-1/2 inch embedment unless noted otherwise on the Drawings. Refer to Section 05090 for approved anchors.

- F. Wall Furring to Concrete or Masonry Wall Fasteners: Hex head screw anchors; minimum 1/4 inch diameter x minimum 1-1/8 inch embedment unless otherwise noted on the Drawings. Refer to Section 05090 for approved anchors.
- G. Furring Channel to Masonry or Concrete Surface Fasteners: Low velocity powder-actuated drive pins of size to suit application.
- H. Welding Materials: AWS D1.3.
- I. Wood Furring, Blocking, and Plywood, Attached to Framing Fasteners: Specified in Section 06100.

## 2.4 FINISHES

- A. Protective Coating: CP 60: G60 (Z180), A60 (ZF180), AZ50 (AZM150), or GF30 (ZGF90).
- B. Galvanizing Repair Paint: SSPC-Paint 20, Type II - organic.

## 2.5 SUBSTITUTIONS

- A. Comply with the requirements of Section 01600.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Examine existing conditions and adjacent areas where products will be installed and verify that conditions conform to product manufacturer's requirements. Verify that building framing components are ready to receive work. Verify that rough-in utilities are in-place and located where required. Do not proceed until unsatisfactory conditions have been corrected.
- B. Beginning of erection indicates acceptance of existing conditions.

### 3.2 INSTALLATION - GENERAL

- A. Install cold-formed metal framing in accordance with ASTM C1007, AISI S200 North America Standard for Cold-Formed Steel Framing and to manufacturer's written instructions unless more stringent requirements are shown or specified.
- B. Install system to provide for 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.
- C. Install system to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.
- D. Install cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened.
- E. Install framing members in one-piece lengths.
- F. Perform field welding in accordance with AWS D1.3.

### 3.3 INSTALLATION - STUD FRAMING

- A. Install studs and fasteners in accordance with manufacturer's published instructions and, where gypsum board is attached to studs, install studs in accordance with GA-216 and ASTM C 1007.
- B. Metal Stud Spacing: 16 inches on center, maximum, unless otherwise shown on the drawings.

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- C. Align stud web openings horizontally.
- D. Construct corners using minimum three studs.
- E. Place studs as indicated on Drawings, minimum 2 inches from abutting walls.
- F. Erect studs one piece full length. Splicing of studs not permitted.
- G. Erect studs, brace, and reinforce to develop full strength to meet design requirements.
- H. Install headers at partition openings using load-bearing C-shaped joists.
- I. Install framing between studs for attachment of mechanical and electrical items.
- J. Coordinate placement of insulation in multiple stud spaces made inaccessible after erection.
- K. Install intermediate studs above and below openings to match wall stud spacing.
- L. Fasten studs adjacent to door and window frames, partition intersections, and corners to top and bottom runner flanges in double-stud fashion with metal lock fastener tools.
  1. Securely fasten studs to jamb and head anchor clips of door and borrowed-light frames.
  2. Place horizontally a cut-to-length section of runner with web-flange bent at each end, fasten with minimum one screw per flange.
  3. Position a cut-to-length stud (extending to top runner) at vertical panel joints over door frame header.
- M. Install bridging for stud partitions over 8 feet high at mid-height with 1-1/2 inch rolled channels through studs and screw attach in place using clip angles. Lap channels by nesting one inside the other to a length of at least 8 inches and wire tie together.
- N. Blocking: Screw attach wood blocking between studs. Install blocking for support of plumbing fixtures, toilet partitions, wall cabinets, toilet accessories, and hardware.
- O. Where optional framing products by the named manufacturers are specified in Part 2 above in lieu of conventional components specified, install in accordance with manufacturers recommendations.
- P. Touch up field welds and damaged galvanized surfaces with galvanizing repair paint.
- Q. Fastening: Fasten framing in accordance with manufacturer's published instructions and schedule below unless indicated otherwise on Drawings.

FASTENERS	MINIMUM CONNECTION
Floor Track to Concrete	1 Anchor at 36 inches on center.
Partition Stud to Floor Track	1 Screw each side at flange.
Stud Web to Stud Web	2 Screws.
Plates and Straps to Studs	2 Screws.
Lateral Bracing to Partition Stud Using clip Angles	2 Screws to stud and 2 Screws to cold rolled channel.
Runner to Header	1 Screw at 16 inches on center, maximum 6 inches from each end.
Welded Connections	Indicated on Drawings.

### 3.4 INSTALLATION - JOIST FRAMING

- A. Install joists and fasteners in accordance with manufacturer's published instructions.
- B. Make provisions for erection stresses. Provide temporary alignment and bracing.

- C. Place joists at locations and spacing as indicated on Drawings.
- D. Touch-up field welds and damaged galvanized surfaces with galvanizing repair paint.
- E. Fastening: Indicated on Drawings.

### 3.5 INSTALLATION - CEILING JOISTS

- A. Install joists and fasteners in accordance with manufacturer's published instructions and, where gypsum board is attached to joists, install joists in accordance with ASTM C 1007 and GA-216.
- B. Ceiling Joist Spacing: 16 inches on center beginning from center of room unless otherwise shown on the drawings.
- C. Install joists in direction of shortest span, parallel and level, with lateral bracing and bridging.
- D. Install joists in one piece full length. Splicing of joists not permitted.
- E. Install perimeter joist runner track sized to match joists. Attach joist runner track to wall framing with minimum 2 screws per stud and at corners and ends.
- F. Attach joist ends to joist runner tracks with minimum 1 screw each side at each flange.
- G. Install bridging at 48 inches on center beginning from center of room with 1-1/2 inch rolled channels screw attached to joists.
  - 1. Stagger bridging at light fixture locations as required.

### 3.6 INSTALLATION - FURRING

- A. Furring Channels: Attach vertically spaced at maximum 16 inches on center, unless otherwise shown on the drawings, to masonry and concrete surfaces with specified powder driven fasteners staggered 24 inches on center on opposite flanges.
- B. Wall Furring:
  - 1. Secure top and bottom runners to structure.
  - 2. Space metal furring at maximum 16 inches on center unless otherwise shown on the drawings.

### 3.7 INTERFACE WITH OTHER WORK

- A. Coordinate erection of studs with hollow metal door frames and overhead coiling door frames.
- B. Coordinate installation of anchors, supports, and blocking for mechanical, electrical, and building accessory items installed within framing.

### 3.8 FIELD QUALITY CONTROL

- A. Field quality control shall be the responsibility of the Contractor in accordance with Section 01452. Except as specified as mandatory, field quality control testing and inspection shall be at the discretion of the Contractor as necessary to assure compliance with Contract requirements. Owner T&I specified in Appendix B shall not preclude Contractor's responsibility to perform similar routine, necessary, and customary testing and inspection of the methods and frequency suitable for the type of work involved.

### 3.9 OWNER TESTING AND INSPECTION (T&I)

- A. The Owner will perform testing and inspection as specified in Appendix B (Section 05400).

END OF SECTION

## SECTION 05500 - METAL FABRICATIONS

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section includes:
1. Shop fabricated ferrous metal items, galvanized and prime painted.
  2. Owner furnished fabricated metal items for installation by Contractor.
- B. Related Requirements: The following list is intended to aid in locating work related to or dependent on the scope of Work in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
1. Section 03310 - Structural Concrete and Exterior Concrete Slabs: Grout for setting metal fabrications.
  2. Section 05090 - Post-installed Concrete and Masonry Anchors: Mechanical and adhesive anchors drilled into concrete or masonry.
  3. Section 05120 - Structural Steel: Connection of miscellaneous framing and supports to structural steel.
  4. Section 06065 - Plastic Materials: Plastic sleeves for steel pipe bollards.
  5. Section 06400 – Architectural Woodwork: Stainless steel countertop when supplied for laminate casework assembly.
  - 6.
  7. Section 09900 - Paints and Coatings: Field painted finishes.
  8. Section 10260 – Owner furnished aluminum diamond plate floor mount rail system refrigerated case protection.
  9. Appendix A – Products and Work By Owner or Separate Contractor: Manufacturers, suppliers, vendor information, and product data related to Owner furnished products, and equipment.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. American National Standards Institute (ANSI):
1. ANSI A 14.3 - Ladders, Fixed, Safety Requirements.
- C. ASTM International (ASTM):
1. ASTM A 36 - Carbon Structural Steel.
  2. ASTM A 53 - Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
  3. ASTM A 123 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
  4. ASTM A 153 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
  5. ASTM A 240 - Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
  6. ASTM A 307 - Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
  7. ASTM A 325 - Structural Bolts, Heat Treated, 120/105 ksi Minimum Tensile Strength.
  8. ASTM A 500 - Cold-formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
  9. ASTM A 591 - Steel Sheet, Electrolytic Zinc-Coated, for Light Coating Mass Applications.
  10. ASTM A 653 - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  11. ASTM A 666 - Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
  12. ASTM A 1008 - Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, Baked Hardenable.
  13. ASTM A 1011 - Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
- D. American Welding Society (AWS):



1. AWS D1.1 - Structural Welding Code.
2. AWS D1.3 - Structural Welding Code - Sheet Steel.

E. National Association of Architectural Metal Manufacturers (NAAMM):

1. Metal Finishes Manual for Architectural and Metal Products.

F. Steel Structures Painting Council (SSPC):

1. SSPC-Paint 20 - Zinc-Rich Coating Type I - Inorganic and Type II - Organic.
2. SSPC-Paint 25 - Zinc Oxide, Alkyd, Linseed Oil Primer for Use Over Hand cleaned Steel Type I and Type II.
3. SSPC-SP3 - Power Tool Cleaning
4. SSPC-PA1 - Shop, Field, and Maintenance Painting of Steel.

### 1.3 SUBMITTALS

A. Shop Drawings: Submit directly to Architect for Contractor furnished items only.

1. Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories.
2. Include erection drawings, elevations, and details where applicable.
3. Indicate welded connections using standard AWS welding symbols. Indicate net weld lengths.
4. Prepare shop drawings under the supervision of a licensed structural Professional Engineer.

B. Submit Shop Drawings within 10 working days of Contract date.

C. Section 01330 - Submittal Procedures: Procedures for submittals.

### 1.4 QUALITY ASSURANCE

A. Qualifications for Welding Work: Qualify welding operators in accordance with Standard Qualification Procedures as required by AWS D1.1.

### 1.5 DELIVERY, STORAGE AND HANDLING

A. Transport, handle, store, and protect products in compliance with the requirements of Section 01600 and manufacturer's recommendations.

B. Delivery and Handling of Owner Furnished, Contractor Installed Items:

1. Product Delivery: Owner's Supplier will deliver products to jobsite. Contact Owner's Supplier to establish product delivery date.
2. Product Packaging: Products will be packaged in manufacturer's standard packaging on shipping pallets. Installation Drawings will be included with products.
  - a. Receiving: Receive and accept products, verify quantity, and report suspected defects or discrepancies in compliance with the requirements of Section 01600.
3. Upon notification by Contractor, Owner will arrange for delivery of replacement products.

## PART 2 - PRODUCTS

### 2.1 OWNER FURNISHED PRODUCTS

A. Owner's Suppliers will furnish the following fabricated metal items as specified in Appendix A (Section 05500) for installation by Contractor.

1. Jib crane hoist arm and railing assembly.
2. Interior floor mounted stainless steel bollards.
3. Interior floor mounted galvanized steel bollards.
4. Aluminum diamond plate impact protection and accessories for column wrap.

### 2.2 MATERIALS

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- A. Steel Plates and Shapes: ASTM A 36.
- B. Bolts, Nuts, and Washers: ASTM A 325 and ASTM A 307.
- C. Cold Rolled Steel Sheet: ASTM A 1008.
- D. Hot Rolled Steel Sheet: ASTM A 1011.
- E. Galvanized Steel Sheets:
  - 1. Structural: ASTM A 653 Structural Quality, G90.
  - 2. Galvanized Sheet Steel: ASTM A 591, Class C.
- F. Stainless-Steel Sheet, Strip, and Plate: ASTM A 240 or ASTM A 666, Type 304 or 430 as shown or specified.
- G. Steel Tubing: ASTM A 500, Grade B.
- H. Steel Piping: ASTM A 53.
- I. Welding Materials: AWS D1.1 and AWS D1.3 type required for materials being welded.
- J. Primers:
  - 1. Shop application and field touch-up: SSPC 25.
  - 2. Touch-up Primer for Galvanized Surfaces: SSPC 20.
  - 3. Color: To match primer used on steel roof deck and joists.
- K. Concrete Inserts: Cast steel or malleable bolts, washers, and shims; galvanized.

## 2.3 FABRICATION

- A. Verify dimensions on site prior to shop fabrication.
- B. Fabricate items with joints tightly fitted and secured.
- C. Fit and shop assemble in largest practical sections, for delivery to site.
- D. Grind exposed welds flush and smooth with adjacent finished surface. Ease exposed edges to small uniform radius.
- E. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Use exposed fasteners of type indicated or, if not indicated, Phillips flat-head (countersunk) screws or bolts. Locate joints where least conspicuous.
- F. Supply components required for anchorage of metal fabrications. Fabricate anchorage and related components of same material and finish as metal fabrication, except where specifically noted otherwise.

## 2.4 FINISHES

- A. Finish metal fabrications after assembly. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Shop prime ferrous-metal items not indicated to be galvanized.
- B. Prime Painting:
  - 1. Prime paint in shop as scheduled.
  - 2. Prepare uncoated ferrous-metal surfaces to comply with SSPC-SP 3, "Power Tool Cleaning."
  - 3. Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1," for shop painting.
  - 4. Do not prime surfaces in direct contact bond with concrete or where field welding is required.
  - 5. Prime paint items scheduled with one coat. Touch up with same primer.

- C. Galvanizing: Hot-dip galvanize items indicated to be galvanized to comply with ASTM A 123 or ASTM A 153 as applicable. Galvanize to minimum 2.0 oz/sq ft zinc coating, exterior items, and those items indicated on Drawings and specified herein, to be galvanized.
- D. Finish Painting: Finish paint after installation as shown on the drawings or specified herein in accordance with Section 09900.

## 2.5 SUBSTITUTIONS

- A. Comply with the requirements of Section 01600 unless noted otherwise herein.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Obtain approval of Owners Construction Manager prior to site cutting or making adjustments not scheduled.
- B. Clean and strip site primed steel items to bare metal where site welding is scheduled.
- C. Make provision for erection loads with temporary bracing. Keep work in alignment.
- D. Use grout specified in Section 03310 for setting metal fabrications.

### 3.2 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Perform field welding in accordance with AWS D1.1 or D1.3, as applicable. After installation, grind sight-exposed field welds smooth, touch-up welds, scratched, or damaged surfaces with primer.

### 3.3 SCHEDULE

- A. Provide items as scheduled herein and as indicated on Drawings.
- B. Include related items and systems necessary to complete the Work including anchorages and attachments necessary for installation
- C. Miscellaneous Bearing Plates and Lintels: Fabricate to sizes and configuration indicated on Drawings; prime paint finish except for items requiring field welding.
- D. Miscellaneous Framing and Supports: Furnish steel framing and supports not specified under Section 05120. Fabricate welded construction in as large units as possible. Drill and tap for hardware and other items. Include anchors required for building into work of other Sections.
  - 1. Interior: Prime paint finish, gray.
  - 2. Exterior: Galvanized.
- E. Rough Hardware: Custom fabricated bolts, plates, anchors, hanger, dowels, and other miscellaneous steel and iron shapes required for framing, supporting, and anchoring other construction. Galvanized unless otherwise indicated on Drawings.
- F. Steel columns not included in Section 05120.
  - 1. Interior: Prime paint finish.
  - 2. Exterior: Galvanized.
- G. Miscellaneous Steel Trim: Profiles and sizes as indicated on Drawings; continuous welded joints and smooth exposed edges. Use concealed field splices where possible. Provide cutouts, fittings, and anchorages; coordinate assembly and installation into work of other Sections.

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1. Interior: Prime paint finish.
  2. Exterior: Galvanized.
- H. Exterior Removable or Concrete Filled Footing Mounted Steel Pipe Bollard (with Steel Pipe Sleeve): ASTM A 53, Type E (electric-resistance welded) or Type S (seamless), Grade B, Schedule 40, height and diameter as shown on Drawings.
1. Pipe Bollard Fill: Fill bollard with concrete or provide cap or plug as indicated on Drawings.
  2. Steel Pipe Sleeve: Schedule 80 non-removable steel pipe sleeve, galvanized, height and diameter as shown on Drawings.
  3. Plastic Sleeves: Install polyethylene thermoplastic pipe sleeves on bollards as specified in Section 06065 and at locations shown on the drawings.
  4. Installation: Install in concrete footing as shown on the drawings.
- I. Interior Core Drilled Steel Pipe Bollards (Interior Back of House and Garden Center): ASTM A 53, Type E (electric-resistance welded) or Type S (seamless), Grade B, Schedule 40.
1. Size: Height and nominal diameter as shown on the drawings.
  2. Fill bollard as indicated on Drawings.
  3. Finish: Field primed and painted in accordance with Section 09900.
  4. Install as shown on the drawings.
- J. Interior Floor Mounted/Anchor Bolted Stainless Steel Bollards (Owner Furnished, Contractor Installed):
1. Location: Where shown on Drawings.
  2. Install in accordance with manufacturer's instructions, using manufacturer supplied hardware.
- K. Interior Floor Mounted Stainless Steel and Galvanized Steel Pipe Bollards at Freezer (Owner Furnished, Contractor Installed):
1. Install in accordance with manufacturer's instructions, using manufacturer supplied hardware.
- L. Steel Pipe Railings: ASTM A53, Type E (electric-resistance welded) or Type S (seamless), Grade B, Schedule 40. Fabricate to dimensions indicated on Drawings. Cope horizontal railings intersecting vertical members. Provide radius bends at changes in direction. Finish as follows:
1. Interior: Prime paint finish.
  2. Exterior: Galvanized.
  3. Set -in sleeves and secure railings to other construction, as indicated on Drawings.
  4. Handrails and Top Rails: Design point load 200 lbs, downward or horizontal, and uniform load of 50 lb/lin ft applied simultaneously in both vertical and horizontal directions. Concentrated and uniform loads need not be assumed to act concurrently.
  5. Intermediate Rails: Uniform load of 25 lbs/sq ft of gross area of railing system, including open area.
  6. Shopping Cart Railings (If Indicated on Drawings): 1-1/2 x 1-1/2 inches by 11 gage tube steel. Weld all connections. No finish required. Coordinate installation with store manager.
- M. Handrail Brackets: Cast iron with not less than 3 inch projection from wall surface to centerline of handrail. Finish as indicated below.
1. Interior: Prime paint finish.
  2. Exterior: Galvanized.
- N. Steel Supports for Overhead Doors, Closures, and Grilles: Channels and tubes as indicated on Drawings for overhead coiling doors, rolling closures, and overhead coiling grilles. Coordinate fabrication with respective section of work.]
1. Anchor frame assembly for seismic protection as shown on drawings. Provide penetration seals as specified in Section 07530.
- O. Exterior Fixed Aluminum Roof Access Ladder at Parapet: Tubular rail ladder as manufactured by one of the following acceptable manufacturers and of the ladder type indicated.
1. [O'Keeffe's, Inc.](mailto:info@okeeffes.com), Brisbane, CA, [info@okeeffes.com](mailto:info@okeeffes.com), (888) 653-3333.
  2. [Precision Ladders, LLC](mailto:info@precisionladders.com), Morristown, TN, [info@precisionladders.com](mailto:info@precisionladders.com), (800) 225-7814 or (423) 586-2265.
  3. [Alaco Ladder Inc](mailto:sales@alacoladder.com), Chino, CA, [sales@alacoladder.com](mailto:sales@alacoladder.com), (888) 310-7040 or (909) 591-7561.

4. [UPNOVR, Inc.](#), Hooksett, NH. Contact Shawn Gosselin, [shawn@upnovr.com](mailto:shawn@upnovr.com), (603) 625-8639.
  5. Low parapet with walk-through ladder rail extensions:
    - a. Model 502 by O’Keeffe.
    - b. Model FLH-04 by Precision.
    - c. Model 561 by Alaco.
    - d. Model U-201 by UPNOVR.
  6. High parapet with walk-through ladder rail extensions, crossover platform, and parapet return:
    - a. Model 503 by O’Keeffe.
    - b. Model FL-06 by Precision.
    - c. Model 564-PRP by Alaco.
    - d. Model U-203 by UPNOVR.
    - e. Ladder Options and Components: Provide ladder with appropriate brackets, extensions, and other accessories determined necessary and identified on the shop drawings.
- P. Automotive Service Pit Walk Surface Grate: Fiberglass 1 ½”D x 48”L x 48”W grate, 1” x 4” mesh pattern.
1. Manufacturer: Provide product by the following or by another manufacturer providing equivalent equipment:
    - a. Delta Composites, LLC, Houston, TX, Contact Amanda Hansen (281) 449-4900.
  2. Finish: Surface: grit. Color: yellow.
- Q. Truck Well Curb Drain: 12 inch square cast iron grate, factory finished black, location as indicated on Drawings.
1. Model No. 1213 (or current equivalent branding) by National Diversified Sales, Inc, (NDS). (888) 825-4716.
- R. Dock Leveler Pit Angles and Channels: Provide perimeter steel angles and channels with welded studs, as indicated on Drawings, for dock leveler pits as required for installation of equipment. Coordinate fabrication with respective section of work.
1. Galvanize after fabrications.
- S. Downspout Nozzle: Cast bronze body and wall flange, with bird screen, with or without hub as required to connect to Vestibule overflow roof drain, size as required. Install per manufacturer’s instructions.
1. Manufacturers:
    - a. Jay R. Smith Manufacturing Company, Montgomery, AL (334) 277-8520.
    - b. Josam Company, Michigan City, IN (800) 365-6726.
    - c. Zurn Industries, Paso Robles, CA (805) 238-7100.
  2. Model:
    - a. Jay R. Smith: 1770 series.
    - b. Josam Company: 25010 series.
    - c. Zurn: Z199 series (plain bronze).
- T. Door Jambs: Fabricate metal door jambs, as indicated on Drawings, for use at traffic doors and overhead doors. Provide mitered and welded corners, ground smooth. Countersink fasteners, minimum six per jamb.
- U. Protector Angle: At locations shown on Drawings.
- V. Smoke Curtain: Provide continuous steel angles as indicated and required for the erection of overhead supported curtains. Coordinate work with Section 05300. Weld steel angles to roof support. Secure curtain in place with self-tapping metal screws, plumb and level with adjacent construction.
- W. Safety Wire Mesh Partitions: 10 to 14 gage steel, 1 x 1 or 1 x 2 inch mesh.
- X. Water Heater Support Framing: Fabricate support frame and floor-to-roof steel tube bracing as indicated on Drawings for overhead water heater platform located in Janitor area. Provide welded connections, ground smooth.
- Y. Vacuum Pump Support Frame: Fabricate support frame and floor-to-roof steel tube bracing as shown on Drawings for installation of vacuum plumbing system pump. Provide welded connections, ground smooth. Coordinate installation of vacuum plumbing system components by others as specified in section 15300.
- Z. Stainless Steel Backsplash:

1. At Existing Vent Hood to Remain High Heat Areas; 20 Gauge, Grade 430 Stainless Steel sheet with No. 3 finish.
    - a. For adhesion of backsplash to wall substrate in high heat areas, provide [MasterBond MB600S](#) one-component heat resistant coating or equivalent bonding product rated for 500F degrees or higher.
  2. At Deli/Bakery on Wall Behind Slicers: 18 Gauge, Grade 304 Stainless Steel sheet with No. 3 finish, hemmed edges, size as shown on Drawings.
    - a. Install with one of the following construction adhesives or equivalent at locations shown on Drawings.
      - 1) Titegrab Construction Adhesive by Titebond.
      - 2) Fast Set Construction Adhesive by Titebond.
    - b. Install backsplash sheet of longest practical length to provide finished appearance.
    - c. Provide silicone sealant as specified in Section 07900 at junction of backsplash edge and wall.
- AA. Stainless Steel Wall Cap: At Deli/Bakery where composite faux tile panels are installed on walls.
1. 20 Gauge, Grade 430 Stainless Steel sheet with No. 3 finish, hemmed edges and corners.
  2. Install cap on half wall and at unglazed window openings where within customer view at locations shown on Drawings.
  3. Install with one of the following construction adhesives or equivalent.
    - a. Titegrab Construction Adhesive by Titebond.
    - b. Fast Set Construction Adhesive by Titebond.
  4. Provide silicone sealant as specified in Section 07900 at junctions of cap edges and walls.
- BB. Closure Panel at Refrigerated Cases: Fabricate and install closure panels as shown on Drawings. Fabricate from stainless steel or galvanized steel sheet as shown.
- CC. Screen Wall Metal Coping Cap:
1. Prepare top surface of existing screen wall as specified in Section 04910.
  2. Provide continuous coping and cleat assembly using bonderized 24 Gauge sheet. Fabricate and install coping using fasteners, wood nailer, self-adhering membrane sealer, and backer rod as shown on Drawings.
  3. Prepare metal sheet and paint as specified in Section 09900 to match adjacent wall color.
  4. Contractor's Option: Where short runs of wall allow for few joints or as otherwise elected, Contractor may provide the following system in lieu of site fabricated assembly:
    - a. [Perma-Tite Double Tapered Coping System](#) by [Metal Era, LLC](#). 20 gauge galvanized steel snap-on clip system. Prepare metal surface and paint to match adjacent wall color as specified in Section 09900 for prefinished metal.
- DD. Aluminum Diamond Plate Surface-Applied Impact Protection for Column Wrap (Owner Furnished, Contractor Installed):
1. Remove existing surface protection material.
  2. After completion of column finish painting, prepare painted surfaces to receive diamond plate.
  3. Install plate using adhesive, trim, or fasteners as shown on Drawings and in accordance with plate protection manufacturer's written instructions.

END OF SECTION

## SECTION 06065 (06 6000) - PLASTIC MATERIALS

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes the following Owner furnished equipment for installation by Contractor:
  - 1. Thermoplastic polyethylene plastic sleeves for steel pipe bollards.
  - 2. Plastic transition strip and plastic perimeter strip at walk-in freezer.
  
- A. Related Requirements: The following list is intended to aid in locating products and work related to or dependent on the scope in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
  - 1. Sect 01600 – Product Requirements: Contractor’s Product Selection Checklist.
  - 2. Section 05500 - Metal Fabrications: Steel pipe bollards to receive plastic sleeves.
  - 3. Appendix A – Products and Work by Owner or Separate Contractor: Manufacturers, suppliers, product information, installation (if applicable), and general procedures related to Owner furnished products.

## 1.2 DELIVERY, STORAGE, AND HANDLING

- A. Section 01600 - Product Requirements: Transport, handle, store, and protect products.

## PART 2 - PRODUCTS

## 2.1 OWNER FURNISHED PRODUCTS

- A. Owner's Supplier will furnish products in the scope of this Section as specified in Appendix A (Section 06065) for installation by Contractor.

## PART 3 - EXECUTION

## 3.1 INSTALLATION

- A. Plastic Sleeves:
  - 1. Install (2) beads of clear 100% silicone sealant by starting beads at opposite sides of top of bollard and spiraling downward, making one complete revolution of bollard with each bead.
  - 2. Slide sleeve over bollard seating sleeve in sealant.
  - 3. Allow sealant to cure and verify sleeve holds fast to bollard.
  - 4. Repeat installation if sleeve can be removed easily from bollard.
  - 5. Do not install sleeves with manufacturer’s double sided foam tape.
  
- B. Install walk-in freezer plastic transition and perimeter strips at locations and as shown on Drawings.
  - 1. If width of plastic transition is shown on Drawings as less than 3 inches, field modify transition as required.
  - 2. If quarry tile is required at transition, verify installation results in equal height of tile and transition.

END OF SECTION

## SECTION 06100 - ROUGH CARPENTRY

## PART 1 - GENERAL

## 1.1 SUMMARY

## A. Section Includes:

1. Blocking and nailers for roofing system and related metal flashings.
2. Preservative and fire resistive treatment.
3. Concealed blocking behind wall mounted items.
4. Structural panel products.
5. Non-structural panel products including the following:
  - a. Backing for electrical and telephone equipment.
  - b. Panels concealed within gypsum board and metal stud partitions.
  - c. Panels used as finish material; walls, ceilings, wainscots, and bases.
6. Panel product and framing for wood and wire mesh doors.

## B. Related Sections:

1. Section 07240/07243 - Exterior Insulation and Finish System: Finish over plywood sheathing at exterior signage.
2. Section 07620 - Sheet Metal Flashing And Trim

## 1.2 REFERENCES

A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.

## B. American Lumber Standards Committee (ALSC):

1. Softwood Lumber Standards.

## C. American Plywood Association (APA):

1. Grades and Standards.

## D. ASTM International (ASTM):

1. ASTM A 123/A - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
2. ASTM A 153 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
3. ASTM A 307 - Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
4. ASTM A 653 - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
5. ASTM E 84 - Test Method for Surface Burning Characteristics of Building Materials.
6. ASTM B 117 - Standard Practice for Operating Salt Spray (Fog) Apparatus.
7. ASTM E 1333 - Test Method for Determining Formaldehyde Concentrations in Air and Emission Rates from Wood Products Using a Large Chamber.

## E. American Society of Mechanical Engineers (ASME):

1. ASME B18.6.1 - Wood Screws (Inch Series)

## F. American Wood Protection Association (AWPA):

1. AWPA M4 - Care of Preservative Treated Wood Products.
2. AWPA U1 - User Specification for Treated Wood.

## G. Department of Commerce (National Institute of Standards and Technology) - Product Standard (DOC):

1. DOC PS 1 - Construction and Industrial Plywood.
2. DOC PS 2 - Performance Standard for Wood Based Structural Use Panels.
3. DOC PS 20 - American Softwood Lumber Standard.

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- H. Southern Pine Inspection Bureau (SPIB):
  - 1. Grading Rules.
- I. Western Wood Products Association (WWPA):
  - 1. Western Lumber Grading Rules.
- J. Underwriters' Laboratories (UL):
  - 1. UL FR-S Classification - Fire Retardant Treated Wood with Flame Spread Ratings of 25 or less in accordance with ASTM E84.
  - 2. UL 723 - Test for Surface Burning Characteristics of Building Materials.

### 1.3 QUALITY ASSURANCE

- A. Lumber Grading Agency: Lumber to be grade stamped by an agency certified by the Board of Review of the American Lumber Standards Committee (ALSC).
- B. Plywood Grading Agency: Certified by APA.
- C. Regulatory Requirements: Conform to applicable codes for fire retardant treatment of wood surfaces for flame/smoke ratings.
- D. Composite Wood Products: Hardwood plywood, particleboard, and medium density fiberboard composite wood products specified herein for exterior or interior applications shall meet the requirements for formaldehyde as specified by the California Air Resources Board, Air Toxics Control Measure for Composite Wood as tested in accordance with ASTM E 1333, and Chap 5 of the CALGreen requirements.

### 1.4 DELIVERY, STORAGE AND HANDLING

- A. Transport, handle, store, and protect products in compliance with the requirements of Section 01600.
- B. Provide proper facilities for handling and storage of materials to prevent damage to edges, ends and surfaces.
- C. Keep materials dry. Stack materials off ground a minimum of 12 inches or if on concrete slab-on-grade a minimum of 1-1/2 inches, fully protected from weather. Provide for air circulation around stacks and under coverings.

## PART 2 - PRODUCTS

### 2.1 MATERIALS AND PRODUCTS

- A. Lumber: DOC PS 20; S4S. Maximum of 19 percent moisture content, surfaced dry, No. 2 any species graded under WWPA grading rules or No. 3 Grade Southern Pine graded under SPIB grading rules.
- B. Plywood Backing Panels: DOC PS 1, Exposure 1, Grade C Plugged veneer, fire retardant treated, thickness indicated but not less than 1/2 inch nominal thickness.
- C. Nonstructural Panel: DOC PS 1 or PS 2, fire retardant treated plywood.
  - 1. Type 1 (Interior): Grade C-D Plugged veneer, Exposure 1, locations and thickness indicated on the Drawings.
  - 2. Type 2 (Exterior): Grade B-B veneer, Exterior, locations and thickness as indicated on the Drawings.
- D. Structural Panels: DOC PS 1 or PS 2.
  - 1. Plywood Wall Sheathing: Grade B-B veneer, Exterior for exterior, Exposure 1 for interior, span rating required to support spacing indicated on Drawings. Thickness: Indicated on Drawings.
  - 2. Plywood Roof Sheathing: Grade B-B veneer, Exposure 1, Structural I, span rating as required to suit support spacing indicated on Drawings. Thickness: As indicated on Drawings.

- E. High Density Wood Fiber Panel Products: Provide one of the following panels with span rating as required to suit support spacing indicated on drawings. Thickness as indicated on drawings.
  - 1. EnergyGuard High Fiberboard, by GAF, (800) 766-3411.
  - 2. Huebert Fiberboard Roof Insulation, by Huebert Brothers Products, LLC; Booneville, MO, (816) 882-2704.

## 2.2 FASTENERS

- A. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity: Comply with the treated lumber manufacturer's recommendations for fasteners and metal components in contact with treated lumber.
  - 1. Fasteners: ASTM A 153, class D for hot dip galvanized fasteners or type 304 or type 316 stainless steel.
  - 2. Other components: ASTM A 653, G-185, with minimum of 1.85 ounces of zinc coating per square foot coverage or type 304 or type 316 stainless steel.
- B. At no time shall any galvanized metal, stainless steel, or other dissimilar metals be in contact with one another.
- C. Nails, Brads and Staples:
  - 1. ASTM F 1667 Galvanized for exterior locations and high humidity areas, and for treated wood
  - 2. ASTM A123 plain finish for other interior locations.
  - 3. Size and type to suit application, unless otherwise noted.
- D. Bolts, Nuts, Washers, and Lag Screws: ASTM A307, Medium carbon steel; size and type to suit application; galvanized for exterior locations, high humidity areas, and treated wood; plain finish for other interior locations, of size and type to suit application, unless otherwise noted.
- E. Wood Screws: ASME B18.6.1
- F. Toggle Bolt Fasteners: For anchorage of non-structural items to hollow masonry.
- G. Expansion Shield Fasteners: For anchorage of non-structural items to solid masonry and concrete.
- H. Powder or Pneumatically Actuated Fasteners: For anchorage of non-structural items to steel.
- I. Fasteners for Wood and Plywood to Light Gage Metal Framing and Metal Deck (up to 10 gage, 0.1345 inch): Self-drilling flat head wood-to-metal screws.
  - 1. Manufacturers:
    - a. Hilti, Tulsa, OK (800) 879-6000.
    - b. ITW Buildex, Itasca, IL (800) 323-0720.
  - 2. Wood and Plywood Up to 3/4 Inch Thick:
    - a. Hilti: S-WD 8-18 x 1-15/16 PFH #3 Black Phosphated.
    - b. ITW: Traxx 10-16 #3 point.
    - c. Pre-drill wood if wood thickness is greater than 1/2 inch or use heavier fastener specified below.
  - 3. Wood less than or equal to 1-1/8 inch thickness to 18 Gage (0.0478 inch) and 20 Gage (0.0359 inch) Metal:
    - a. Hilti: S-WD 10-24 x 1-1/2 PWH #3 wafer head screw.
    - b. ITW: Traxx 10-16 #3 point.
    - c. Pre-drill wood if wood thickness is greater than 1/2 inch.
  - 4. Wood less than or equal to 1-3/4 inch thickness to 16 Gage (0.598 inch) and Heavier Metal (less than or equal to 0.232 inches):
    - a. Hilti: S-WW 12-24 x 2-1/2 PFH #4 Wings.
    - b. ITW: Traxx 12-24 #4 Point with Wings.
  - 5. Wood less than or equal to 2-inch thickness to 16 Gage (0.598 inch) and heavier metal (less than or equal to 1/4 inch):
    - a. Hilti: S-WW 1/4-20 x 2-3/4 PFH #4 Wings.

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- J. For wall and roof sheathing panels, provide screws with organic-polymer or other corrosion-protective coating having a salt-spray resistance of more than 800 hours according to ASTM B 117 with wafer heads or reamer wings as specified above, length as shown or as recommended by screw manufacturer for material being fastened.
- K. Fasteners for Structural Wood Members to Solid Grouted Masonry: Adhesive anchors, size and length as indicated on Drawings.
  - 1. Anchor adhesive: Cartridge type two-component adhesive for embedding anchors.
    - a. HIT HY-150 by Hilti Corp.
    - b. Epcon System, Ceramic 6 by ITW Ramset/Red Head
    - c. Epoxy-Tie SET by Simson Strong Tie Co. Inc., Pleasanton, CA (800) 925-5099.
    - d. Substitutions: Not permitted.
- L. Fasteners for Non-Structural Wood Members to Masonry: Masonry screw anchor with Phillips or Torx flat head, size and length as shown on the drawings.
  - 1. Hilti: Kwik-Con II fastener.
  - 2. ITW: Tapcon masonry anchor.
- M. Alternate Manufacturers: Subject to compliance with project requirements, fasteners by alternate manufacturers of equal types to those specified may be provided, except where substitutions are specifically prohibited.

### 2.3 WOOD TREATMENT

- A. Preservative Pressure Treated Lumber Treatment:
  - 1. Products and Manufacturers: Provide any of the following:
    - a. Wolman CCA, by Arch Wood Protection, Smyrna, GA, (770) 801-6600.
    - b. CCA Pressure Treatment by Hoover Treated Wood Products Inc., Thomson, GA, (800) .832-9663.
    - c. SupaTimber, by Viance, Charlotte, NC, (800) 421-8661.
  - 2. Treat lumber in accordance with AWP A U1; Use Category UC2 for interior construction not in contact with the ground; Use Category UC3b for exterior construction not in contact with the ground; and Use Category UC4a for items in contact with the ground.
  - 3. Preservative Chemicals shall be acceptable to Authorities Having Jurisdiction and contain no arsenic or chromium where prohibited.
  - 4. Kiln dry lumber after treatment to 15-19 percent moisture content. Do not use warped material or materials that do not comply with requirements for untreated material. Material to be painted or stained shall have knots and pitch streaks sealed as with untreated wood.
  - 5. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review and acceptable to Authorities Having Jurisdiction.
- B. Field-Applied Lumber Preservative:
  - 1. Provide the following:
    - a. Inorganic boron.
    - b. Copper naphthenate.
- C. Fire Retardant Treatment:
  - 1. Products and Manufacturers: Provide any of the following:
    - a. Dricon FRT (exterior and interior), by Arch Wood Protection, Smyrna, GA, (770) 801-6600.
    - b. Exterior X (exterior) and Pyro-Guard (interior) by Hoover Treated Wood Products, Inc.; Thomson, GA; (800)-832-9663.
    - c. D-Blaze (interior) by Viance, Charlotte, NC; (800) 421-8661.
  - 2. Identify fire retardant treated wood with appropriate classification marking of testing and inspecting agency acceptable to Authorities Having Jurisdiction.
  - 3. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not bleed through, contain colorants, or otherwise adversely affect finishes.
  - 4. Kiln dry lumber after treatment, to an average moisture content of 19 percent or less.
  - 5. Kiln dry plywood after treatment, to an average moisture content of 15 percent or less.
  - 6. Chemicals used to treat material shall be free of halogens, sulfates, ammonium phosphate and formaldehyde.

7. Treatment material shall provide protection against termites and fungal decay and shall be registered for use as a wood preservative by the U. S. Environmental Protection Agency.
- D. Wood Requiring Treatment:
1. Lumber, Preservative Treated:
    - a. Nailers, blocking, stripping, and similar items in conjunction with roofing, flashing, and other construction.
    - b. Sills, blocking, furring, stripping, and similar items in contact with masonry or concrete.
  2. Lumber, Fire Retardant Treated:
    - a. Wood in concealed spaces.
    - b. Wood exposed within the roof/ceiling assembly.
  3. Interior Plywood, Fire Retardant Treated:
    - a. Plywood used as finish material, walls, wainscots, and bases in fire-rated corridors.
    - b. Plywood backing for electrical and telephone equipment.
  4. Plywood Not to be Fire Retardant Treated: Structural plywood performing a structural function, such as a component of roof, floors or shear walls.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine areas to receive rough carpentry work and verify following:
1. That installation of building components to receive rough carpentry work is complete.
  2. That surfaces are satisfactory to receive work.
  3. That spacing, direction and details of supports are correct to accommodate installation of blocking, backing, stripping, furring and nailing strips.

#### 3.2 SITE TREATMENT OF WOOD MATERIALS

- A. Wood Treatment at Site: Comply with AWWA M4 for applying field treatment to cut surfaces of preservative treated lumber.
1. Use inorganic boron for items continuously protected from liquid water.
  2. Use copper naphthenate for items not continuously protected from liquid water.

#### 3.3 INSTALLATION

- A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.
1. Construct members of continuous pieces of longest possible lengths.
  2. Do not splice structural members between supports, unless otherwise indicated.
- B. Provide blocking and framing indicated and necessary to support facing materials, fixtures, specialty items, and trim.
1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches o.c.
- C. Secure members in place with specified fastener. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Do not countersink nail heads unless otherwise indicated.
- D. Wood Ground, Sleeper, Blocking, and Nailer: Install where indicated and where required for screeding or attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
1. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated.
  2. Recess heads of fasteners below surface of wood members.

- E. Wood Furring: Install level and plumb with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.
- F. Install firestopping complying with Section 07840 in concealed spaces with wood blocking, horizontally and vertically in accordance with drawings, minimum 2 inches thick where space is not blocked by framing members.
- G. Tapered Wood Shim (edge strip) at Parapet Cap:
  - 1. Provide shaped high density wood fiber or wood material as indicated at the optional Parapet Detail.
  - 2. Shape wood material for continuous support of metal coping.
- H. Fasteners: Install fasteners with manufacturer's recommended power tool for each type of fastener.

#### 3.4 PROTECTION

- A. Protect rough carpentry from weather throughout construction period.

END OF SECTION

## SECTION 06165 - FIBERBOARD PANELS

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Tack bulletin boards.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. ASTM International (ASTM):
  - 1. ASTM C 209 - Test Methods for Cellulosic Fiber Insulating Board.
  - 2. ASTM C 954 - Steel Drill Screws for the Application of Gypsum Board or Metal Plaster Bases to Steel Studs From 0.033 inches to 0.112 inches in Thickness.
  - 3. ASTM C 1002 - Steel Self-Piercing Tapping Screws for The Application Of Gypsum Panel Products Or Metal Plaster Bases To Wood Studs Or Steel Studs.
  - 4. ASTM D 1037 - Test Methods of Evaluating Properties of Wood-Base Fiber and Particle Panel Materials.
  - 5. ASTM E 84 - Test Method for Surface Burning Characteristics of Building Materials.
- C. Occupational Safety and Health Administration (OSHA):
  - 1. OSHA 01926.1153 Respirable Crystalline Silica.

## 1.3 ENVIRONMENTAL REQUIREMENTS

- A. Minimize dust emissions and provide equipment that suppresses dust.

## 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Transport, handle, store, and protect products in compliance with the requirements of Section 01600 and manufacturer's recommendations.

## 1.5 PROJECT CONDITIONS

- A. Acclimatize panels to existing moisture conditions and for not less than 24 hours before installation. Comply with manufacturer's recommendations.

## PART 2 - PRODUCTS

## 2.1 MATERIALS

- A. Fiberboard: Molded, recycled post-consumer paper, cellulose fiber structural panel manufactured and constructed as acoustic board insulation.
  - 1. Thickness: 1/2 inch.
  - 2. Density: Minimum 15 pcf when tested in accordance with ASTM C209.
  - 3. Tensile Strength: Minimum 150 psi parallel and 600 psi perpendicular when tested in accordance with ASTM C209.
  - 4. Water Absorption by Volume: Not to exceed the maximum percent when tested in accordance with ASTM D 1037.
  - 5. Expansion: 50 to 90 percent relative humidity in accordance with ASTM C209.
  - 6. Thermal Resistance: When tested in accordance with ASTM C209 per ASTM C518:
    - a. R-value: 1.2

7. Flame Spread: 76 to 200 tested in accordance with ASTM E84, Class III or C.
8. Subject to compliance with requirements specified herein, provide fiberboard manufactured by one of the following:
  - a. [440 Sound Barrier](#) by Homasote Company, West Trenton, NJ (800) 257-9491.
  - b. [Soundstop](#) by Blue Ridge Fiberboard, (800) 535-4088 or (800) 233-8721.
  - c. Equivalent product by other manufacturers.

B. Trim: Casing as shown on Drawings.

## 2.2 ACCESSORIES

### A. Panel Fasteners:

1. Fastening to sheathing: ASTM C 954 and C 1002, Type S-12 bugle head, corrosion-resistant self-drilling self-tapping steel screws; length as required to penetrate framing members 3/4" minimum.
2. Fastening to concrete masonry unit (CMU): Masonry screw anchor with Phillips or Torx flat head, 3/16 inch in diameter x 1-3/4 inch. Provide one of the following:
  - a. Kwik-Con II fastener by [Hilti](#), Tulsa, OK (800) 879-6000.
  - b. Tapcon masonry anchor by [ITW Buildex](#), Itasca, IL (800) 323-0720.

B. Trim Fasteners: As shown on Drawings.

C. Field Applied Paint Finish for Panel and Trim: Water-based acrylic enamel, semi-gloss, as specified in Section 09900 for wood substrates.

1. Color: Match color of adjacent wall as shown on Drawings.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Prepare substrate in accordance with fiberboard panel manufacturer's recommendations.
- B. Beginning of installation is acceptance of substrate.

### 3.2 INSTALLATION

- A. Install panel where noted on the Drawings in accordance with manufacturer's instructions.
- B. Install only clean, dry, undamaged panels.
- C. When fastening panel to CMU, provide drills equipped with a HEPA-rated filter vacuum dust collection system recommended by the manufacturer to maintain dust emissions below the permissible level.
  1. Drill pilot holes accurately and squarely. Clean holes in accordance with the manufacturer's recommendations using a HEPA-rated filter vacuum.
- D. Install panel trim pieces concurrently with installation of panels. Miter cut panel trim at corners to provide smooth transition. Ensure moldings are straight and correctly aligned.
- E. Prepare and paint installed trim as specified in Section 09900 for wood substrates.
- F. Apply continuous bead of sealant in corner seams.
- G. Sealant shall not be visible in completed system.

END OF SECTION

## SECTION 06200 - FINISH CARPENTRY

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Interior standing and running trim.
- B. Related Requirements:
  - 1. Section 06100 - Rough Carpentry: Panel product used as finish material on walls, ceilings, wainscots, and bases.
  - 2. Section 06400 - Architectural Woodwork: Plastic and simulated wood trim and custom wood trim.
  - 3. Section 09900 - Paints and Coatings: Opaque and transparent finishes.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. American Woodworking Institute (AWI):
  - 1. AWI - Architectural Woodwork Standards.
- C. American Plywood Association (APA):
  - 1. APA - Grades & Specifications.

## 1.3 DELIVERY, STORAGE AND HANDLING

- A. Section 01600 - Material and Equipment: Transport, handle, store, and protect products.

## PART 2 - PRODUCTS

## 2.1 WOOD MATERIALS

- A. Interior Standing and Running Trim : AWI Custom Grade; plain sawn, Grade II lumber.
  - 1. Painted Finish: Closed-grain hardwood, any species.
  - 2. Clear Sealed Hardwood: One of the following hardwood species. Use one species throughout.
    - a. Ash.
    - b. Birch.
    - c. Oak.
- B. Panel Product for Finish Material on Walls, Ceilings, Wainscots, and Bases: See Section 06100.

## 2.2 HARDWARE

- A. Fasteners: Size and type to suit application; galvanized for exterior and high humidity locations; plain finish at other locations.

## 2.3 FABRICATION

- A. Fabricate to AWI Architectural Woodwork Standards.
  - 1. Standing and Running Trim: Custom Grade.

## PART 3 - EXECUTION



3.1 INSTALLATION

- A. Install woodwork plumb, level, and straight without distortion; use concealed shims. Scribe and cut woodwork to fit adjoining work. Anchor woodwork items to nailers or blocking or directly to substrate using concealed fasteners.
- B. Standing and Running Trim: Install with minimum joints, using maximum lumber lengths possible. Cope at returns; miter at corner.
- C. Site Finishing: Refer to Section 09900.

END OF SECTION

## SECTION 06400 - ARCHITECTURAL WOODWORK AND MILLWORK ASSEMBLIES

## PART 1 - GENERAL

## 1.1 SUMMARY

## A. Section Includes:

1. Plastic Laminate Casework, countertop, and accessories.
2. Owner furnished Breakroom, Modular Pharmacy, and Vision Center Casework, countertop, accessories, and appurtenant equipment for installation by Contractor.
3. Owner furnished Prefabricated Architectural Slat Wall panel and Architectural Ledge System for installation by Contractor.
4. Stainless steel countertop for plastic laminate casework.

## B. Related Requirements: The following list of items is intended to aid in locating products and work related to or dependent on the scope in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.

1. Section 06100 - Rough Carpentry: Lumber and panel products used for wood and wire mesh doors.
2. Section 06424 - Protective Surfacing: High impact, rigid sheet wall covering. Surface material for site built interior ledge assembly by Contractor.
3. Section 07240/07243 - Exterior Insulation and Finish System: EIFS Cornice Trim.
4. Section 13030 - Modular Building Components: Owner furnished Modular Pharmacy assemblies and equipment.
5. Appendix A - Products and Work by Owner or Separate Contractor: Manufacturers, suppliers, product information, installation (if applicable), and general procedures related to Owner furnished products.

## 1.2 REFERENCES

## A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.

## B. American National Standards (ANSI):

1. ANSI A208.1 - Particleboard
2. ANSI A208.2 - Medium Density Fiberboard For Interior Use

## C. Architectural Woodwork Institute (AWI) / Architectural Woodwork Manufacturers Association of Canada (AWMAC) / Woodwork Institute (WI) - Joint Publication:

1. AWI/AWMAC/WI - Architectural Woodwork Standards.

## D. Engineered Wood Association (APA): APA - Grades &amp; Specifications.

## E. National Electrical Manufacturer's Association (NEMA)

1. NEMA LD3 - High-Pressure Decorative Laminates

## 1.3 DELIVERY, STORAGE AND HANDLING

## A. Transport, handle, store, and protect products in compliance with the requirements of Section 01600.

## B. Inspect materials delivered and reject those not qualifying with requirements, those damaged in transit, or those that appear otherwise unsatisfactory.

## C. Schedule delivery of items to installation areas that are in proper condition to receive them. Place items neatly and systematically to avoid damage, store in clean, dry, enclosed, and secure storage area.

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- D. Receive Owner Furnished products in accordance with the requirements of Section 01600.
  - 1. Product Delivery: Owner's Supplier will deliver Owner furnished products to site to be received by Contractor. Contact Owner's Suppliers to coordinate delivery of Owner furnished products and materials.

## PART 2 - PRODUCTS

### 2.1 OWNER FURNISHED PRODUCTS

- A. Owner's Supplier will furnish replacement wall cap in non-modular Pharmacy Paint-Fix-Clean projects privacy walls if shown on Drawings and as specified in Appendix A (Section 06400) for installation by Contractor.
- B. Supercenter Vision Center Millwork and Equipment: Owner's Supplier will furnish Vision Center millwork/casework, equipment, and associated components as specified in Appendix A (Section 06400) and Owner Furnished Equipment Schedule for installation by Contractor.
- C. Pharmacy Modular Millwork and Equipment: Owner's Supplier will furnish Modular Pharmacy millwork/casework, equipment, privacy walls, and associated components as specified in Appendix A (Section 06400).
  - 1. Owner furnished Modular Pharmacy equipment and assemblies not detailed in Appendix A (Section 06400) are scheduled in Appendix A (Section 13030).
- D. Breakroom Millwork and Miscellaneous Scheduled Millwork: Owner's Supplier will furnish modular millwork as shown on drawings or specified in Appendix A (Section 06400 or Owner Furnished Equipment Schedule) for installation by Contractor.
- E. Preassembled Architectural Slat Wall Panel: Owner's Supplier will furnish custom architectural slat wall assembly as specified in Appendix A (Section 06400) for installation by Contractor.
- F. Preassembled Architectural Ledge System: Owner's Supplier will furnish ledge system assembly as specified in Appendix A (Section 06400) for installation by Contractor.

### 2.2 LAMINATES AND ACCESSORIES BY CONTRACTOR

- A. Manufacturers – Laminates and Accessories:
  - 1. High Pressure Laminate (HPL): By one of the following as specified in the Color/Pattern Schedule below:
    - a. Formica Corporation; Indianapolis, IN, (800) 729-8956.
    - b. Panolam Surface Systems and its subsidiaries Nevamar Decorative Surfaces and Pionite Decorative Surfaces, Shelton, CT. Contact: John Trulock, (407) 618-3732, [john\\_trulock@panolam.com](mailto:john_trulock@panolam.com).
    - c. Wilsonart; Temple, TX; Contact: Brynn Bishop, (720) 346-4538.
- B. Adhesives:
  - 1. Wilsonart; Temple, TX; Contact: Brynn Bishop, (720) 346-4538.
  - 2. ITW Polymers Sealants North America, Irving, TX, (800) 878-7876.
  - 3. Franklin International, Columbus, OH, (800) 877-4583.
- C. Product Descriptions – Laminates and Accessories:
  - 1. High Pressure Laminate (HPL): NEMA LD3; color, pattern, and finish as indicated in the Laminate Color/Pattern Schedule herein.
    - a. Exposed Horizontal Surfaces: GP-50.
    - b. Exposed Vertical Surfaces: GP-50.
    - c. Postformed Surfaces: PF-42.
    - d. Thickness: Nominal 0.050 inch thick.

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2. Thermofused Melamine Panel (TFM): Particleboard or medium density fiberboard (MDF) finished with thermally fused, melamine impregnated decorative paper.
3. Medium Density Fiberboard (MDF): ANSI A208.2, Grade MD, made with binder containing no urea formaldehyde resin.
4. Particleboard: Density 45 lb., ANSI A208.1, Grade M-2, made with binder containing no urea formaldehyde resin.
5. Adhesives: Low VOC adhesive, as recommended by laminate manufacturer and suitable for shop or field application.
  - a. Toxicity / IEQ:
    - 1) Comply with applicable regulations regarding toxic and hazardous materials.
    - 2) Comply with Green Seal Standard GS-36 for commercial aerosol adhesives.
    - 3) Comply with California's South Coast Air Quality Management District (SCAQMD) Rule No. 1168 in areas where exposure to freeze/thaw conditions and direct exposure to moisture will not occur. In areas where freeze/thaw conditions exist or direct exposure to moisture can occur, then comply with California's Bay Area AQMD Regulation 8, Rule 51 for containers larger than 16 oz. and with California Air Resource Board (CARB) for containers 16 oz or less.
  - b. Acceptable Products: Provide the following or equivalent as recommended by laminate manufacturer.
    - 1) 3000 Adhesive Series by Wilsonart.
    - 2) Sta'-Put SP80 Contact Adhesive by ITW.
    - 3) Titebond Advanced Polymer Construction Adhesive by Franklin International.
    - 4) Approved Alternate: Liquid Nails Heavy Duty Construction Adhesive LN-903/LNP-903.
6. Fasteners: Unless otherwise recommended by the manufacturer, use size and type to suit application; galvanized or stainless for exterior and high humidity locations; plain finish at other locations.
7. Edge Banding: Edge banding shall be 3 mm thick x 1-5/8 inch strip banding of ABS/PVC composition by Wilsonart, or equivalent.
  - a. Color: PL-7 as described below.
  - b. Color: PL-4 as described below.
  - c. Color: PL-31 as described below.
  - d. Color: PL-34 as described below.

D. Laminate Color/Pattern Schedule:

1. Provide one color where two or more are specified. Provide laminate specified below as applicable and as shown/scheduled on the Drawings. All PL designations are for HPL unless otherwise indicated. Colors shown in parentheses are generic color names.
  - a. PL-1: (Light Gray): Reserved for Sam's Club program.
  - b. PL-3: (White): No. 4945-38 Organic Cotton, by Wilsonart.
  - c. PL-4 (Maple):
    - 1) No. WM791 Hardrock Maple, by Pionite.
    - 2) No. 10776HW-60 Kensington Maple, by Wilsonart
    - 3) No. W290 Hardrock Maple, by Panolam. (TFM)
  - d. PL-6 (Light Tan): No. 4143-60 Neutral Glace, by Wilsonart.
  - e. PL-7 (Medium Brown): No. 96-60 Shadow, by Wilsonart.
  - f. PL-9 (Dark Gray):
    - 1) No. SG228 Slate, by Pionite.
    - 2) No. D91-60 Slate Grey, by Wilsonart.
  - g. PL-11 (Medium Gray):
    - 1) No. 928-58 Mouse (matte finish), by Formica.
    - 2) No. D90-60 North Sea, by Wilsonart.
  - h. PL-12 (Gray): No. 4843-60 Mysted Zephyr by Wilsonart.
  - i. PL-15: (Brown): No. MKT-001T Golden Iron Moonrock, by Nevamar.
  - j. PL-20 (Tan): No. 4762HW-60 Mystique Dawn, by Wilsonart.
  - k. PL-28 (Light Wood): No. 7939K-18 Blond Echo, by Wilsonart.
  - l. PL-30: No. 4879 Steel Mesh, by Wilsonart.
  - m. PL-31: No. 1500-60 Grey, by Wilsonart.
  - n. PL-32: No. VA2002 Vision Vava, by Nevamar.

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- o. PL-33: (Black): Reserved for Sam's Club program.
- p. PL-34: No. D354 Designer White by Wilsonart.

E. Substitutions: Not permitted.

## 2.3 STAINLESS STEEL COUNTERTOP

- A. Stainless Steel Countertop: Provide 18 Gauge, Grade 304 Stainless Steel sheet with No. 3 finish on 3/4-inch panel particle core substrate. Stainless steel sheet is specified in Section 05500.

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Install items specified herein where and as shown on the Drawings.

### 3.2 PLASTIC LAMINATE CASEWORK

- A. Where new plastic laminate is indicated for existing casework, remove existing laminate and/or finishes to base substrate prior to installation of new. Installation of new laminate over existing is not acceptable, no exceptions.
- B. Install woodwork plumb, level, and straight without distortion; use concealed shims. Scribe and cut woodwork to fit adjoining work. Anchor woodwork items to nailers or blocking or directly to substrate using concealed fasteners.
- C. Casework: Provide well fitting and smooth operating doors and drawers.
- D. Install laminate on vertical surfaces with directional pattern or grain oriented vertically. Install laminate on horizontal surfaces with directional pattern or grain oriented parallel to length of countertop.

### 3.3 ARCHITECTURAL SLAT WALL PANEL AND LEDGE SYSTEM

- A. Architectural Slat Panel and Ledge System as specified herein are preconfigured as assemblies by Owner's Supplier. Site-built Ledge Systems are specified in Section 06424.
- B. Download and use the [Slat Wall Panel Installation Guide](#) and [Ledge System Installation Guide](#).
- C. Examine surfaces and adjacent areas where assemblies will be installed. Verify substrates are flat, clean, dry, solid, and free from coatings and defects detrimental to installation.
- D. Custom Preassembled Architectural Slat Wall Assembly:
  - 1. Remove existing rigid sheet wall coverings to base substrate prior to installation of slat wall panel.
  - 2. Begin with the starter edge and assemble overlapping panels as shown in the Slat Wall Installation Guide. Cut the final assembly to fit openings and wall requirements.
  - 3. Gypsum Board Substrate: Attach directly to gypsum wall using Franklin International's Titebond construction adhesive or the approved alternate adhesive as specified herein. Use drywall screws to fasten in recesses of slats at panel joints and in pre-drilled holes in edge panels.
  - 4. Split Face CMU Substrate or Irregular Wall Surface: Vertical plane may vary. If necessary to achieve flat attachment surface, use 7/8-in. hat furring channel on building wall surface.
- E. Preassembled Architectural Ledge System Assembly:
  - 1. Cut plywood support cleat, midsections, and transition pieces as required to fit entryway.
  - 2. Begin wall attachment with left vertical side piece and continue with overhead midsections and right vertical side piece as described in the Installation Guide; install gussets where required.
  - 3. Reference Ledge System Installation Guide for fasteners attaching horizontal ledge pieces to support cleat. Provide fasteners as shown on Drawings for installing ledge pieces and cleat to metal stud or CMU wall

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substrate.

### 3.4 COUNTERTOPS

- A. Countertops: Anchor countertops securely to base units.

END OF SECTION

## SECTION 06424 - PROTECTIVE SURFACING

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Owner furnished interior rigid sheet protective surface covering for installation by Contractor.
- B. Related Requirements: The following list is intended to aid in locating products and work related to or dependent on the scope of this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
  - 1. Section 06400 - Architectural Woodwork: Substrates for and assemblies using protective surfacing. Preassembled architectural slat wall panel and ledge system assemblies.
  - 2. Section 09250 - Gypsum Board: Substrate for protective surfacing.
  - 3. Section 10260 – Wall and Corner Guards: Aluminum outside corner guards.
  - 4. Appendix A – Products and Work by Owner or Separate Contractor: Manufacturers, suppliers, product information, installation (if applicable), and general procedures related to Owner furnished products.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. ASTM International (ASTM):
  - 1. ASTM E 84 - Test Method for Surface Burning Characteristics of Building Materials.
  - 2. ASTM D1308 - Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes.
  - 3. ASTM F476 - Standard Test Methods for Security of Swinging Door Assemblies.

## 1.3 QUALITY ASSURANCE

- A. Installer qualifications: Not less than 3years experience in installation of materials produced by the manufacturers specified herein on projects similar to the scope of this work.
- B. Fire Performance Requirements:
  - 1. Surface Burning Characteristics: Conform to the following in accordance with ASTM E 84.
    - a. Flame Spread: 25 or less.
    - b. Smoke Density: 450 or less.
- C. Impact Strength Requirements:
  - 1. Tested in accordance with and meets or exceeds the applicable provisions of ASTM F 476.
- D. Chemical and Stain Resistance Requirements:
  - 1. Tested in accordance with and meets or exceeds ASTM D 1308.

## 1.4 DELIVERY, STORAGE AND HANDLING

- A. Transport, handle, store, and protect products in compliance with the requirements of Section 01600.
- B. Receive Owner Furnished products in accordance with the requirements of Section 01600.
  - 1. Product Delivery: Owner’s Supplier will deliver Owner furnished products to site to be received by Contractor. Contact Owner’s Suppliers to coordinate delivery of Owner furnished products and materials.

- C. Store in clean, dry, enclosed, and secure storage area. Store flat and in accordance with manufacturer's published requirements.
- D. Protect protective surfacing products and accessories, especially adhesive, from freezing temperatures, excessive heat, temperature fluctuations, humidity and moisture penetration.

#### 1.5 PROJECT CONDITIONS

- A. Store material in an environment of 65-75°F for at least 24 hours prior to beginning the installation.
- B. Installation areas shall be enclosed and weatherproofed before installation commences.

### PART 2 - PRODUCTS

#### 2.1 OWNER FURNISHED PRODUCTS

- A. Owner's Supplier will furnish protective wall coverings, adhesives, and trim units as specified in Appendix A (Section 06424) for installation by Contractor.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine surfaces and adjacent areas where protective wall covering will be installed and verify that substrates are flat, clean, dry, solid, and free from coatings and defects detrimental to installation. Verify that surfaces conform to product manufacturer's requirements for substrate conditions.

#### 3.2 PREPARATION

- A. Where new protective surfacing is to be installed, remove existing surfacing and/or finishes to base substrate prior to installation of new. Installation of new protective surfacing over existing is not acceptable, no exceptions.
- B. Prepare substrate for protective wall covering installation in accordance with manufacturer's published instructions and recommendations.

#### 3.3 INSTALLATION – GENERAL

- A. Relative humidity shall not exceed 80% at time of installation.
- B. Apply caulk at butt joints as required to fill gaps.
- C. Maintain temperature between 65-75°F for at least 48 hours after the installation.

#### 3.4 INSTALLATION – PROTECTIVE SURFACING AS WAINSCOT

- A. Install protective wall covering and accessories in accordance with manufacturer's published instructions.
  - 1. Install wall covering using adhesive as provided by wall covering supplier.
  - 2. Install inside corner trim using included adhesive tape.
  - 3. Install manufacturer's outside corner trim using adhesive tape or contact adhesive as provided by wall covering supplier.
  - 4. Install aluminum outside corner trim as specified in Section 10260.

#### 3.5 CLEANING



- A. Immediately upon completion of installation, clean protective surfacing and accessories in accordance with manufacturer's recommended cleaning method.
- B. Remove surplus materials, rubbish and debris resulting from installation as work progresses and upon completion of work.

3.6 PROTECTION

- A. Protect installed protective surfacing from subsequent construction activities. Use materials that may be easily removed without leaving residue or permanent stains.

END OF SECTION

## SECTION 06610 - GLASS FIBER REINFORCED PLASTIC (FRP)

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes: Owner furnished Fiberglass Reinforced Plastic (FRP) coated panels and accessories for installation by Contractor.
- B. Related Requirements: The following list is intended to aid in locating products and work related to or dependent on the scope in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
  - 1. Section 09720 – Composite Decorative Faux Tile Wall Panels: Specifications for FRP-fabricated interior faux subway tile panel (FT-1) (Marlite).
  - 2. Appendix A – Products and Work by Owner or Separate Contractor: Manufacturers, suppliers, product information, installation (if applicable), and general procedures related to Owner furnished products.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. ASTM International (ASTM):
  - 1. ASTM E 84 - Test Method for Surface Burning Characteristics of Building Materials.
  - 2. ASTM D 256 - Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics.
  - 3. ASTM D 638 - Test Method for Tensile Properties of Plastics.
  - 4. ASTM D 790 - Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.

## 1.3 DELIVERY, STORAGE AND HANDLING

- A. Transport, handle, store, and protect products in compliance with the requirements of Section 01600.
- B. Receive Owner Furnished products in accordance with the requirements of Section 01600.
  - 1. Product Delivery: Owner's Supplier will deliver Owner furnished products to site to be received by Contractor. Contact Owner's Suppliers to coordinate delivery of Owner furnished products and materials.
- C. Store in clean, dry, enclosed, and secure storage area. Store flat on supplier's original shipping palettes and in accordance with manufacturer's published requirements.
- D. Protect adhesive from freezing temperatures, excessive heat, temperature fluctuations, humidity and moisture penetration.

## PART 2 - PRODUCTS

## 2.1 OWNER FURNISHED PRODUCTS

- A. Owner's Supplier will furnish FRP panels and accessories as specified in Appendix A (Section 06610) for installation by Contractor.

## PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Examine surfaces and adjacent areas where products will be installed and verify that surfaces conform to product manufacturer's requirements for substrate conditions. Do not proceed until unsatisfactory conditions have been corrected.
- B. Beginning of installation indicates acceptance of substrate conditions.

### 3.2 PREPARATION

- A. Where new FRP wall panels are to be installed, remove existing wall panels and/or finishes to base substrate prior to installation of new. Installation of new wall panels over existing is not acceptable, no exceptions.
- B. Prepare substrate for product installation in accordance with manufacturer's published instructions.

### 3.3 INSTALLATION

- A. FRP Panels:
  - 1. Install FRP wall panels in accordance with manufacturer's published instructions.
  - 2. Prefit each wall panel before securing in place. Cut panels with carbide-tipped power saw or swivel-head shear.
  - 3. Provide manufacturer's recommended spacing between abutting panel ends, edges and trim. Provide minimum 1/8 inch space around pipes, electrical fittings, obstructions and other items penetrating panels. Fill joints with sealant.
  - 4. Install panels with edges vertical and plumb. Use maximum length pieces to provide minimum number of end joints.
    - a. Align panel to panel vertical joints at inside and outside corner conditions.
  - 5. Substrate: Apply adhesive to substrate and to panel backs as recommended by manufacturer with V-notch spreader. Provide 100 percent coverage of adhesive.
  - 6. Install accessory panel trim pieces concurrently with installation of panels. Miter cut accessory panel trim at corners to provide smooth transition. Set trim attached to adjacent panel ends and edges and seal with sealant.
    - a.
  - 7. Seal corner seams, base and ceiling junctures, and junctures between panels and wall with sealant. Remove excess sealant during installation.
  - 8. Provide sealant around all openings, corners, and joints.

### 3.4 FIELD QUALITY CONTROL

- A. Inspect installation, accessories, and fastening to substrate.

END OF SECTION

## SECTION 07210 - BUILDING INSULATION

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Board Insulation.
  - 2. Thermal Batt Insulation.
  - 3. Sound Attenuation Insulation (Unfaced Sound Batts).
  
- B. Related Requirements: The following list is intended to aid in locating work related to or dependent on the scope of Work in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
  - 1. Section 04200 - Unit Masonry Assemblies: Masonry fill insulation.
  - 2. Section 07840 - Firestopping: Safing insulation used in conjunction with fire stop material.
  - 3. Section 09250 - Gypsum Board: Metal furring.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
  
- B. ASTM International (ASTM):
  - 1. ASTM E 84 - Test Method for Surface Burning Characteristics of Building Materials.
  - 2. ASTM C 665 - Specification for Mineral-Fiber Blanket Thermal Insulation (Duct Wrap or Equipment Insulation).
  - 3. ASTM C 991 - Specification for Flexible Glass Fiber Insulation.
  - 4. ASTM C 1289 - Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
  - 5. ASTM E 136 - Behavior of Materials in a Vertical Tube Furnace at 750° C.

## 1.3 DEFINITIONS

- A. Concealed Insulation: Insulation concealed within framing system, both faces protected by finish material.
  
- B. Exposed Insulation: Insulation exposed within framing system, one or both faces unprotected.

## 1.4 DELIVERY, STORAGE AND HANDLING

- A. Transport, handle, store, and protect products in compliance with the requirements of Section 01600 and manufacturer's recommendations.

## PART 2 - PRODUCTS

## 2.1 MANUFACTURERS

- A. Provide products from one of the following manufacturers meeting the requirements specified in the Materials paragraph below. Proprietary products listed in the Materials paragraph are provided for example only:
  - 1. Atlas Roofing Corporation, Atlanta, GA (800) 933-1476.
  - 2. CertainTeed Corporation, Valley Forge, PA, (800) 233-8990.
  - 3. Dupont Performance Building Solutions, Wilmington, DE, (833) 338-7668.
  - 4. Holcim-Elevate (formerly Firestone Building Products Company), Nashville, TN.
  - 5. Johns Manville Commercial Building Insulations, Denver, CO, (800) 654-3103.
  - 6. Kingspan Insulation LLC (a Division of Kingspan Group/Kingspan USA), Atlanta, GA, (678) 589-7300.

7. Knauf Insulation (Knauf North America) (including Guardian Insulation products), Shelbyville, IN (317) 398-4434.
8. Owens-Corning, Toledo, OH, (800) 438-7465.

## 2.2 REGULATORY REQUIREMENTS

- A. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated, as determined by testing identical products per ASTM E 84 for surface-burning characteristics and other methods specified. Identify materials with appropriate markings of applicable testing and inspecting agency.

## 2.3 MATERIALS

- A. Batt Insulation: ASTM C 665 mineral fiber blanket insulation.
  1. Unfaced Glass Fiber: Type I (blankets without membrane facing); with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively passing ASTM E 136 for combustion characteristics.
  2. Faced, Glass-Fiber: Type III (blankets with reflective membrane facing), Class A (membrane-faced surface with a flame-spread index of 25 or less); Category 1 (membrane is a vapor barrier), faced with vapor-retarder membrane on 1 face.
  3. Sound Attenuation Insulation (Sound Batts): Unfaced glass fiber insulation as specified above.
  4. Provide batt insulation by one of the following manufacturers:
    - a. CertainTeed Corporation.
    - b. Johns Manville.
    - c. Knauf/Guardian Insulation.
    - d. Owens Corning.
- B. Board Insulation:
  1. Extruded Polystyrene:
    - a. Type VI : ASTM C578, Type VI (density 1.8 pcf minimum); square edges. Provide one of the following:
      - 1) Styrofoam 40 High Load by DuPont.
      - 2) Foamular 400 by Owens Corning.
- C. Garden Center Expansion polyisocyanurate acrylic coated white board insulation is specified in Section 07410.
- D. Substitutions: Comply with the requirements of Section 01600.

## 2.4 ACCESSORIES

- A. Tape: Polyethylene or polyester self-adhering type; two inches wide.
- B. Adhesive: Waterproof type, acceptable to manufacturer of insulation board. Adhesive VOC shall be within the limits of not greater than 70 g/L in accordance with the California's South Coast Air Quality Management District (SCAQMD) Rule No. 1168.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Batt Insulation:
  1. Verify adjacent materials are dry and ready to receive installation.
  2. Verify mechanical and electrical services within walls have been installed and tested.
- B. Board Insulation:
  1. Verify substrate and adjacent materials and insulation boards are dry and ready to receive insulation and adhesive.
  2. Verify insulation boards are unbroken, free of damage.

3.2 INSTALLATION - BATT INSULATION

- A. Install batt insulation in accordance with manufacturer's instructions, without gaps or voids.
- B. Trim insulation neatly to fit spaces. Use batts free of damage. Fit insulation tight in spaces and tight to exterior side of mechanical and electrical services within the plane of insulation.
- C. Install insulation with factory applied membrane facing warm side of building spaces. Lap ends and side flanges of membrane. Attach insulation in place to framing; tape seal butt ends and lapped side flanges. Tape seal tears or cuts in membrane.
- D. Install minimum [24 inches][36 inches][48 inches] of board insulation full height of foundation wall from top of footing to bottom of slab with remainder laid horizontally beneath the slab.
- E. Apply adhesive in three continuous beads to board insulation.
- F. Install boards on foundation wall or grade beam perimeter. Place boards by method to maximize contact bedding. Stagger joints. Butt edges and ends tight to adjacent board and to protrusions.
- G. Extend boards over expansion and control joints, unbonded to foundation two inches both sides of joint. Backfill carefully to prevent damage to insulation boards.

3.3 INSTALLATION - BOARD INSULATION BENEATH FREEZER

- A. Coordinate with concrete Sections of Division 3 for timely placement of insulation board.
- B. Install two layers of insulation board in areas beneath freezers. Refer to Drawings for locations and details.

3.4 INSTALLATION - INSULATION AT EXTERIOR MASONRY WALLS

- A. Install insulation as shown on the Drawings.

3.5 SCHEDULES

- A. Provide insulation types as scheduled below and as indicated on Drawings.

CONDITION/LOCATION	TYPE OF INSULATION	THICKNESS
Exterior Wall, Soffits, & Ceiling	Faced Batt Insulation	3-1/2 inches (R=11) or 6 inches (R=19) as shown; or as required to fill cavity.
Interior Partitions	Unfaced Mineral or Glass Fiber Batt	3-1/2 inches or 6 inches as Shown.
Sound Attenuation	Unfaced Glass Fiber Batt	3-1/2 inches or 6 inches as Shown.
Foundation Perimeter Insulation	Extruded Polystyrene, Type IV	1.0 inches (R=5.0)
Foundation Perimeter Insulation	Extruded Polystyrene, Type IV	1.5 inches (R=7.5)
Foundation Perimeter Insulation	Extruded Polystyrene, Type IV	2.0 inches (R=10.0)
Stoop Slab Insulation	Extruded Polystyrene, Type IV	As shown on Drawings
Freezer Slab Insulation	Extruded Polystyrene, Type VI	6.0 inches
Board Insulation at Furred Exterior Masonry Walls	Polyisocyanurate	1.5 inches (R=10.8) or as shown on Drawings.

END OF SECTION

## SECTION 07240 - EXTERIOR INSULATION AND FINISH SYSTEMS

## PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes:
1. Field applied exterior insulation and finish system.
  2. Resurfacing of existing exterior insulation and finish systems.
    - a. Cleaning of existing system.
    - b. Repair of existing system surface defects.
    - c. Application of new finish coating.
- B. Related Requirements: The following list is intended to aid in locating work related to or dependent on the scope of Work in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
1. Section 05400 - Cold Formed Metal Framing: Framing for gypsum sheathing substrate.
  2. Section 06100 - Rough Carpentry: Non-structural plywood panels used for sheathing.
  3. Section 07900 - Joint Sealers: Joint sealants used in conjunction with exterior insulation and finish system.
  4. Section 09250 - Gypsum Board: Gypsum sheathing.
  5. Section 09900 - Paint and Coatings: Field applied paint finish.
  6. Section 10200 – Vents and Louvers: Soffit vents.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. ASTM International (ASTM):
1. ASTM E84 - Test Method for Surface Burning Characteristics of Building Materials.
  2. ASTM D1682 - Test Method for Breaking Load and Elongation of Textile Fabrics.

## 1.3 SYSTEM DESCRIPTION

- A. Exterior Insulation and Finish System (EIFS) shall consist of the following:
1. Thermal insulation board secured to supporting structural system.
  2. Reinforcing mesh set into a trowel applied primer/adhesive base coat.
    - a. Standard reinforcing mesh.
  3. Acrylic-based trowel-applied weatherproof and textured finish with integral white coloring and field applied paint finish.
  4. Primers, backer rods, bond breakers, and sealants for all EIFS to EIFS, and EIFS to dissimilar material joints.

## 1.4 SUBMITTALS

- A. Contract Closeout Submittals:
1. Contractor Installation Declaration Form: Include completed Exhibit A and Exhibit B forms (included at the end of this section) signed by EIFS Contractor and Sealant Installer, under provisions of Section 01770.

## 1.5 QUALITY ASSURANCE

- A. Applicator: Single firm, approved in writing by system manufacturer, employing trained workers familiar with current installation methods and materials.
- B. Standards: Current model code approval by ICBO, BOCA, and SBCC.
1. Base approval on full scale diversified Fire Testing, end use configuration by independent agencies whose

classifications and requirements have general acceptance as regulatory.

- C. Technical Representative: A manufacturer's technical representative shall be on site to oversee the repair of surface defect repairs and resurfacing to verify proper installation of product(s).

## 1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to site in original unopened packages, clearly marked with manufacturer's name, brand name, and description of contents. Store materials in accordance with manufacturer's recommendations for storage and handling.

## 1.7 PROJECT CONDITIONS

- A. Ambient air temperature shall be 40 degrees F or greater and rising at time of installation of coating application and shall remain at 40 degrees F or greater for at least 24 hours after application.
  - 1. Provide temporary heat as required to meet above requirements.
- B. Ambient air temperature shall be as recommended by manufacturers of EIFS and cleaning products during cleaning of existing system prior to resurfacing.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Subject to compliance with requirements, provide EIFS by one of the following:
  - 1. [Sto Corp.](#), Atlanta, GA. Contact: Chuck Duffin, Strategic Accounts (888) 786-3437.
  - 2. [Dryvit Systems, Inc.](#), Warwick, RI, (800) 556-7752. Contact: Bob Dazel, AIA, Marketing manager for Strategic Accounts (734)276-0404.
  - 3. [BASF Wall Systems, Inc.](#), Jacksonville, FL (Includes Senergy Products) (800) 221-9255. Contact: Steve DonFrancesco (770) 335-5260.
  - 4. [Omega Products International, Inc.](#), Los Angeles, CA, (800) 600-6634.
  - 5. [Parex USA, Inc.](#), Redan, GA, (800) 537-2739.
- B. Substitutions: Not permitted.

### 2.2 PRODUCTS

- A. Products:
  - 1. StoTherm Essence, by Sto Industries.
  - 2. Outsulation, by Dryvit Systems, Inc.
  - 3. Senerflex Classic PB Wall System, by BASF
  - 4. Standard System, by Parex, Inc.
- B. Insulation Board: Insulation board shall be produced by manufacturer approved by EIFS manufacturer meeting the following requirements.
  - 1. Type: Expanded Polystyrene Insulation Board.
  - 2. Nominal Density: 1.0 pcf.
  - 3. Maximum Flame-Spread and Smoke Development: ASTM E-84, 25 and 450 respectively.
  - 4. Thickness: As indicated on Drawings but not less than 3/4 inch at any point.
- C. Reinforcing Mesh: Manufacturer's open weave type glass fiber fabric complying with ASTM D1682 as supplied by system manufacturer:
  - 1. Standard Weight: Minimum 4.2 ounces per square yard plus or minus 10 percent.
  - 2. Heavy Weight: Minimum 20 ounces per square yard plus or minus 10 percent.
- D. Coating System:
  - 1. Base Coat: Acrylic based, modified portland cement (Type I or II) and silica sand to function as base coat

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- for coating application and mixed with base coat liquid admixture as supplied by system manufacturer.
2. Primer (For use over gloss urethane coating): Material recommended by EIFS manufacturer.
  3. Skim Coat (For resurfacing of existing EIFS where shown on Drawings):
    - a. Skim Coat, by BASF Wall Systems, Inc. (Senergy).
    - b. Freestyle or NCB, by Dryvit Systems, Inc.
    - c. 302 ABC-N1 Base Coat & Adhesive, by Parex, Inc.
    - d. RFP, by Sto Industries.
  4. Finish Coat: Acrylic based, modified portland cement (Type I or II) and silica sand; compatible with base coat and mixed with finish coat liquid admixture as supplied by system manufacturer.
    - a. Integral Color: Match Dryvit standard #310 "China White."
    - b. Paint Finish: Field applied paint finish as specified in Section 09900. Color as shown on the drawings and as defined within Section 09900.
    - c. Texture: Match Dryvit standard "Sandblast". If new Exterior Insulation and Finish System is installed adjacent to existing Exterior Insulation and Finish System with finish coat texture other than that specified, consult with the Wal-Mart Construction Manager for finish coat to be installed at new adjacent Exterior Insulation and Finish System.
- E. Water: Potable.
- F. Joint Sealant: Joint sealant shall be as specified in Section 07900 unless otherwise required by the EIFS manufacturer.

### PART 3 EXECUTION

#### 3.1 EXAMINATION

- A. Examine surfaces and adjacent areas in which Work under this Section is to be performed. Report in writing to Wal-Mart Construction Manager prevailing conditions that may adversely affect satisfactory execution of Work. Do not proceed with Work until unsatisfactory conditions have been corrected.
- B. Starting Work constitutes acceptance of existing conditions and this Contractor shall then, at his expense, be responsible for correcting unsatisfactory and defective Work encountered.

#### 3.2 INSTALLATION - GENERAL

- A. Follow manufacturer's printed instructions for installation of exterior insulation and finish system.

#### 3.3 INSULATION BOARD INSTALLATION

- A. Install rigid insulation board to conform to insulation manufacturer's printed recommendations except as otherwise specified and modified by system manufacturer.
- B. Place insulation starting from level base line. Stagger vertical joints with insulation board interlocked at corners. Butt joints of insulation tightly. Flush surfaces of adjacent boards at joints.
- C. Apply insulation to substrate providing firm butt joints. Tamp entire surface with even pressure to ensure complete contact with adhesive. Test installation of each board with the use of a 6 foot straight edge.
  1. Allow adhesive a minimum of 24 hours to dry.
  2. Sand surfaces which are high and out of plane until flush. Do not fill low areas.
- D. Form 3/4 inch drip rustication joints straight and true to line, as indicated on Drawings.

#### 3.4 ACCESSORIES

- A. Locate expansion joints at locations indicated; do not exceed manufacturer's maximum recommended area. Coordinate placement of additional joints with Wal-Mart Construction Manager.

### 3.5 REINFORCING MESH

- A. Place reinforcing mesh over insulation and secure in place with base coating.
- B. Apply heavy weight mesh in conjunction with standard weight mesh in areas below 8 feet above ground level.

### 3.6 FINISH SYSTEM

- A. Base Coat:
  - 1. Mix in accordance with manufacturer's instructions and apply to insulation surfaces.
  - 2. Trowel material into reinforcing mesh in tight coat and doubling back. Cover reinforcing mesh 100 percent with base coat.
  - 3. Apply base coat in such a manner as to level surface and fill joints. Apply base coat 1/8 inch to 3/16 inch thick.
  - 4. Cure base coat as directed by manufacturer.
- B. Skim Coat (Resurfacing):
  - 1. Clean existing system in accordance with manufacturer's instructions.
  - 2. Inspect surface of existing system in presence of manufacturer's technical representative and make any required repairs in accordance with manufacturer's published instructions.
  - 3. Prime existing EIFS surfaces previously coated with gloss urethane coating as recommended by EIFS manufacturer prior to application of skim coat.
  - 4. Prior to application of skim coat over existing EIFS with urethane coating, perform bond test to substrate as recommended by EIFS manufacturer.
  - 5. Apply skim coating material as recommended by manufacturer at the minimum thickness required to fill in the existing surface texture and provide a flat, smooth surface ready to accept final textured finish.
    - a. If existing, maintain rustication joints clear of skim coat.
  - 6. Allow to dry as recommended by manufacturer.
  - 7. Correct any imperfections that may telegraph through the finish coat.
- C. Textured Finish:
  - 1. Mix in accordance with manufacturer's printed instructions.
  - 2. Do not apply finish texture until previous coat has cured properly.
  - 3. Trowel finish coat onto surface and float to achieve uniform texture to match approved sample.
  - 4. Apply and level material in one operation.
  - 5. Obtain final texture by trowels or floats as necessary to achieve specified finish.
  - 6. Provide finish coat 1/16 inch to 1/8 inch thick.

### 3.7 CURING

- A. Apply coating materials at 40 degrees F or above. Cure each coat at least 24 hours prior to application of next coat.

### 3.8 JOINTING

- A. Install sealant at joints within system and where system abuts dissimilar materials. Apply joint sealant type and method in accordance with Section 07900 unless otherwise required to conform to the sealant manufacturer's installation methods and procedures and the EIFS manufacturers evaluation report.

END OF SECTION

EXHIBIT A

EIFS Contractor Name: \_\_\_\_\_  
(Insert EIFS Contractor Name Here)

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

THE EXTERIOR INSULATION AND FINISH SYSTEM (EIFS) INSTALLED ON THE STRUCTURE LOCATED AT THE ADDRESS INDICATED BELOW CONFORMS:

TO \_\_\_\_\_ RECOMMENDED INSTALLATION PRACTICES AND  
(Insert EIFS Manufacturer Name Here)

SECTION(S) \_\_\_\_\_ OF [ICBO] [BOCA] [SBCCI] EVALUATION REPORT NO. \_\_\_\_\_  
(Insert Appropriate Section Numbers Here)(Circle Applicable Code) (Insert Applicable Report Number Here)

Address of Structure:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Product Component Names:

Adhesive(s): \_\_\_\_\_  
Fasteners (Mech.): \_\_\_\_\_  
Base Coat: \_\_\_\_\_  
Reinforcing Fabric: \_\_\_\_\_  
Finish Coat (s): \_\_\_\_\_

INSTALLATION

CONFORMS

A. Substrate Type and Tolerance

\_\_\_\_\_

B. EIFS

- 1. Adhesive and/or Fasteners
- 2. Insulation
- 3. Reinforcing Fabric
- 4. Base Coat
- 5. Finish

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

C. The information entered above is offered in testimony that the EIFS installation conforms with the EIFS manufacturer's installation methods and procedures, and the EIFS manufacturers ES report.

D. An installation card shall be received from the Sealant Installer indicating that the sealant installation conforms with the EIFS evaluation report and sealant manufacturer's installation methods and procedures must accompany this declaration.

EIFS Contractor Company Name and Address:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Signature of Responsible Officer: \_\_\_\_\_

Typed Name and Title of Officer: \_\_\_\_\_

Telephone Number: ( \_\_\_\_\_ ) \_\_\_\_\_

cc: Original: Building Department (Must be submitted with sealant installer declaration.)

Copies: EIFS Manufacturer  
Wal-Mart (include in Final Closeout Submittals)

EXHIBIT B

Sealant Installer Name: \_\_\_\_\_  
(Insert Sealant Installer Name Here)

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

THE SEALANT INSTALLED IN CONJUNCTION WITH AN EXTERIOR INSULATION AND FINISH SYSTEM (EIFS) INSTALLED ON THE STRUCTURE LOCATED AT THE ADDRESS INDICATED BELOW CONFORMS:

TO \_\_\_\_\_ and \_\_\_\_\_ RECOMMENDED  
(Insert EIFS Manufacturer Name Here) (Insert Sealant Manufacturer Name Here)

INSTALLATION PRACTICES AND SECTION(S) \_\_\_\_\_ OF [ICBO] [BOCA] [SBCCI]  
(Insert Appropriate Section Numbers Here) (Circle Applicable Code)

EVALUATION REPORT NO. \_\_\_\_\_  
(Insert Applicable Report Number Here)

Address of Structure:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Product Component Names:  
Primer(s): \_\_\_\_\_  
Sealers: \_\_\_\_\_  
Bond Breakers: \_\_\_\_\_  
Sealant Materials: \_\_\_\_\_

INSTALLATION

CONFORMS

A. Designer's requirements, details and instructions

\_\_\_\_\_

B. Sealant Manufacturer's details and Requirements

\_\_\_\_\_

C. Exterior Insulation Manufacturer's Requirements

\_\_\_\_\_

D. The information entered above is offered in testimony that the Sealant installation conforms with the Sealant manufacturer's installation methods and procedures, and the EIFS manufacturers evaluation report.

Sealant Installer Company Name and Address:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Signature of Responsible Officer: \_\_\_\_\_

Typed Name and Title of Officer: \_\_\_\_\_

Telephone Number: ( \_\_\_\_\_ ) \_\_\_\_\_

cc: Original: Building Department (Must be submitted with EIFS contractor declaration.)

Copies: EIFS Manufacturer  
EIFS Contractor  
Sealant Manufacturer  
Wal-Mart (include in Final Closeout Submittals)

## SECTION 07243 - WATER-DRAINAGE EXTERIOR INSULATION AND FINISH SYSTEM (EIFS)

## PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes:
1. Field applied water-drainage exterior insulation and finish system (EIFS) applied over sheathing or masonry units.
  2. Resurfacing of existing exterior insulation and finish systems.
    - a. Cleaning of existing system.
    - b. Repair of existing system surface defects.
    - c. Application of new finish coating.
- B. Related Sections: The following list is intended to aid in locating work related to or dependent on the scope of Work in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
1. Section 05400 - Cold Formed Metal Framing: Framing for gypsum sheathing substrate.
  2. Section 06100 - Rough Carpentry: Non-structural plywood panels used for sheathing.
  3. Section 07900 - Joint Sealers: Joint sealants used in conjunction with exterior insulation and finish system.
  4. Section 09250 - Gypsum Board: Gypsum sheathing.
  5. Section 09900 - Paint and Coatings: Field applied paint finish.
  6. Section 10200 – Vents and Louvers: Soffit vents.
  7. Appendix B – Testing, Inspection and Observation by Owner: Procedures for inspection, testing, and documentation by Owner furnished testing laboratory.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. American National Standards Institute (ANSI)
1. ANSI 99-A - Exterior Insulation And Finish Systems (EIFS)
- C. ASTM International (ASTM):
1. ASTM C 578 - Rigid, Cellular Polystyrene Thermal Insulation
  2. ASTM C 1063 - Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster
  3. ASTM E 84 - Surface Burning Characteristics of Building Materials.
  4. ASTM D 1784 - Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds
  5. ASTM E 2430 - Expanded Polystyrene ("EPS") Thermal Insulation Boards For Use In Exterior Insulation and Finish Systems ("EIFS").
  6. ASTM E 2568 - PB Exterior Insulation and Finish Systems.
- D. ICC Evaluation Service, Inc. (ICC-ES)
1. ICC-ES AC212 - Acceptance Criteria For Water-Resistive Coatings Used As Water-Resistive Barriers Over Exterior Sheathing
  2. ICC-ES AC235 - Acceptance Criteria For EIFS Clad Drainage Wall Assemblies
- E. National Fire Protection Association (NFPA)
1. NFPA 268 - Standard Test Method For Determining Ignitibility Of Exterior Wall Assemblies Using A Radiant Heat Energy Source
  2. NFPA 259 - Standard Test Method For Potential Heat Of Building Materials

### 1.3 SYSTEM DESCRIPTION

- A. Section includes water-drainage exterior insulation and finish system (EIFS) applied over sheathing or masonry substrate.

### 1.4 PERFORMANCE REQUIREMENTS

- A. Bond Integrity: System shall be free from bond failure within EIFS components or between system and supporting wall construction, resulting from exposure to wind loads, weather, or other in-service conditions.
- B. Weathertightness: System shall be resistant to water penetration from exterior into water-drainage EIFS and assemblies behind it or through them into interior of building that results in deterioration of thermal-insulating effectiveness or other degradation of EIFS and assemblies behind it, including substrates, supporting wall construction, and interior finish, and including a means that allows water entering into an EIFS assembly to drain to the exterior.
- C. Physical Properties, Structural Performance, and Drainage Provisions: Comply with ICC-ES AC235 or ANSI 99-A.

### 1.5 SUBMITTALS

- A. Comply with the requirements of Section 01330.
- B. Evaluation Reports: Submit ICC-ES report for drainable EIFS system (including insulation), from applicable model code organization.

### 1.6 CLOSEOUT SUBMITTALS

- A. Comply with the requirements of Section 01770.
- B. Contractor Installation Declaration Forms: Include completed Exhibit A and Exhibit B forms (included at the end of this section) signed by EIFS Contractor and Sealant Installer.

### 1.7 QUALITY ASSURANCE

- A. Applicator Qualifications: Single firm, approved in writing by system manufacturer, employing trained workers familiar with current installation methods and materials. Applicator shall have not less than 2 years documented experience in the installation of the specific drainable system to be installed.
- B. Source Limitations: Obtain EIFS from single source from single EIFS manufacturer and from sources approved by EIFS manufacturer as compatible with system components.
- C. Fire-Test-Response Characteristics: Provide EIFS and system components with the following fire-test-response characteristics as determined by testing identical EIFS and system components per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.
  1. Full-Scale Diversified Fire Test: Per ASTM E 108 modified for testing vertical walls.
  2. Radiant Heat Exposure: No ignition of EIFS per NFPA 268.
  3. Potential Heat: Acceptable level per NFPA 259.
  4. Surface-Burning Characteristics: Insulation board, adhesives, base coats, and finish coats with flame-spread index of 25 or less and smoke-developed index of 450 or less, per ASTM E 84.

### 1.8 PRODUCT DELIVERY

- A. Deliver materials to site in original unopened packages, clearly marked with manufacturer's name, brand name, and description of contents.

## PART 2 PRODUCTS

07243-2



## 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide EIFS by one of the following:
1. [Sto Corp.](#), Atlanta, GA. Contact: Chuck Duffin, Strategic Accounts (888) 786-3437.
  2. [Dryvit Systems, Inc.](#), Warwick, RI, (800) 556-7752. Contact: Bob Dazel, AIA, Marketing manager for Strategic Accounts (734)276-0404.
  3. [BASF Wall Systems, Inc.](#), Jacksonville, FL (Includes Senergy Products) (800) 221-9255. Contact: Steve DonFrancesco (770) 335-5260.
  4. [Omega Products International, Inc.](#), Los Angeles, CA, (800) 600-6634.
  5. [Parex USA, Inc.](#), Anaheim, CA, Contact: Susan Foster, Architectural Sales & National Accounts Manager (714) 319-3186 or (866) 516-0061) or Technical Support (800) 226-2424.
- B. Substitutions: Not permitted.

## 2.2 PRODUCTS

- A. Products: Drainable Class PB EIFS System. Provide one of the following products:
1. Sto Therm ci Essense System by Sto
  2. Outsulation Plus MD by Dryvit.
  3. Senerflex Channeled Adhesive Design by BASF – Senergy.
  4. Akroflex Water Managed Plus (WM+) System by Omega.
  5. Standard Watermaster by Parex.
- B. Substitutions: Comply with the requirements of 01600.

## 2.3 MATERIALS

- A. Applicability: Provide materials and EIFS components standard with the manufacturer for the product systems listed and selected for the project. Products listed below shall apply to the extent applicable to the system to be installed.
- B. Compatibility: Provide water-resistive coating, adhesive, fasteners, board insulation, reinforcing meshes, base- and finish-coat systems, sealants, and accessories that are compatible with one another and with substrates and approved for use by EIFS manufacturer for Project.
- C. Water-Resistive Coatings: EIFS manufacturer's standard formulation and accessories for use as water/weather-resistive barriers, compatible with substrate, and complying with physical and performance criteria of ICC-ES AC212.
- D. Flexible-Membrane Flashing: Cold-applied, fully self-adhering, self-healing, rubberized-asphalt and polyethylene-film composite sheet or tape and primer; EIFS manufacturer's standard or product recommended in writing by EIFS manufacturer.
- E. Drainage Mat: Three-dimensional, nonwoven, entangled filament, nylon or plastic; or woven or fused, self-furring, PVC mesh lath mat designed to drain incidental moisture by gravity; EIFS manufacturer's standard or product recommended in writing by EIFS manufacturer with manufacturer's standard application method suitable for intended substrate.
- F. Spacers: Closed-cell polyethylene or woven or fused, self-furring, PVC mesh lath furring strips; EIFS manufacturer's standard or product recommended in writing by EIFS manufacturer with manufacturer's standard application method suitable for intended substrate.
- G. Insulation Adhesive: Standard formulation for EIFS system used.
- H. Molded, Rigid Cellular Polystyrene Board Insulation: Comply with ASTM C 578, Type I; EIFS manufacturer's requirements; and EIMA's "EIMA Guideline Specification for Expanded Polystyrene (EPS) Insulation Board."
1. Channeled Board Insulation: EIFS manufacturer's standard factory-fabricated profile with linear, vertical drainage channels, slots, or waves on the back side of board.

- I. Reinforcing Mesh: Balanced, alkali-resistant, open-weave, glass-fiber mesh; complying with ASTM D 578 and the following:
  - 1. Standard-Impact Reinforcing Mesh: Not less than 4.0 oz./sq. yd.
  - 2. Heavy-Duty Reinforcing Mesh: Not less than 20 oz./sq. yd. .
  - 3. Strip Reinforcing Mesh: Not less than 3.75 oz./sq. yd.
  - 4. Detail Reinforcing Mesh: Not less than 4.0 oz./sq. yd.
  - 5. Corner Reinforcing Mesh: Not less than 7.2 oz./sq. yd.
- J. Base-Coat Materials: Standard formulation.
- K. Primer: Factory-mixed, elastomeric-polymer primer. Primer for use when resurfacing EIFS previously coated with gloss urethane coating shall be as specifically recommended by the EIFS manufacturer.
- L. Skim Coat (For resurfacing of existing EIFS where shown on Drawings):
  - 1. Skim Coat, by BASF Wall Systems, Inc. (Senergy).
  - 2. Freestyle or NCB, by Dryvit Systems, Inc.
  - 3. 302 ABC-N1 Base Coat & Adhesive, by ParexLahabra, Inc.
  - 4. RFP, by Sto Industries.
- M. Finish-Coat Materials: Factory-mixed, standard acrylic-based coating.
  - 1. Integral Color: Dryvit standard #310 "China White."
  - 2. Paint Finish: Field applied paint finish as specified in Section 09900. Color as shown on the drawings and as defined within Section 09900.
    - a. Texture: Dryvit standard "Sandblast". If new Exterior Insulation and Finish System is installed adjacent to existing Exterior Insulation and Finish System with finish coat texture other than that specified, consult with the Wal-Mart Construction Manager for finish coat to be installed at new adjacent Exterior Insulation and Finish System.
- N. Mechanical Fasteners: Corrosion-resistant fasteners consisting of thermal cap, standard washer and shaft attachments, and fastener suitable for substrate.
- O. Trim Accessories: Mmanufactured from UV-stabilized PVC and complying with ASTM D 1784 and ASTM C 1063.
- P. Joint Sealant: Joint sealant shall be as specified in Section 07900 unless otherwise required by the EIFS manufacturer.

### PART 3 EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of EIFS.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Begin coating application only after surfaces are dry.

#### 3.2 PREPARATION

- A. Protect contiguous work from moisture deterioration and soiling caused by application of EIFS. Provide temporary covering and other protection needed to prevent spattering of exterior finish coats on other work.
- B. Protect EIFS, substrates, and wall construction behind them from inclement weather during installation. Prevent penetration of moisture behind drainage plane of EIFS and deterioration of substrates.

- C. Prepare and clean substrates to comply with EIFS manufacturer's written instructions to obtain optimum bond between substrate and adhesive for insulation.

### 3.3 INSTALLATION

- A. Comply with EIFS manufacturer's written instructions for installation of EIFS as applicable to type of substrate indicated.
- B. Water-Resistive Coatings: Apply over substrates to protect substrates from degradation and to provide water-/weather-resistive barrier.
- C. Flexible-Membrane Flashing: Install over weather-resistive barrier, applied and lapped to shed water; seal at openings, penetrations, terminations, and where indicated by EIFS manufacturer's written instructions to protect wall assembly from degradation. Prime substrates, if required, and install flashing to comply with EIFS manufacturer's written instructions and details.
- D. Trim: Apply trim accessories at locations indicated on Drawings.
- E. Drainage Mat: Apply wrinkle free, continuously, with edges over water-/weather-resistive barrier according to manufacturer's written instructions.
- F. Board Insulation: Attach to substrate.
- G. Expansion Joints: Install at locations indicated, where required by EIFS manufacturer, where expansion joints are indicated in substrates behind EIFS; where EIFS adjoin dissimilar substrates, materials, and construction; and where wall height changes
  1. Do not exceed manufacturer's maximum recommended area.
  2. Coordinate placement of additional joints with Wal-Mart Construction Manager.
- H. Base Coat: Apply to exposed surfaces of insulation and foam shapes in minimum thickness recommended in writing by EIFS manufacturer, but not less than 1/16-inch dry-coat thickness.
- I. Reinforcing Mesh:
  1. Place reinforcing mesh over insulation and secure in place with base coating.
  2. Completely embed mesh in wet base coat, applying additional base-coat material if necessary, so reinforcing-mesh color and pattern are not visible.
  3. Apply heavy weight mesh in conjunction with standard weight mesh in areas below 8 feet above ground level.
- J. Skim Coat (Resurfacing):
  1. Clean existing system in accordance with manufacturer's instructions.
  2. Inspect surface of existing system in presence of manufacturer's technical representative and make any required repairs in accordance with manufacturer's published instructions.
  3. Prime existing EIFS surfaces previously coated with gloss urethane coating as recommended by EIFS manufacturer prior to application of skim coat.
  4. Prior to application of skim coat over existing EIFS with urethane coating, perform bond test to substrate as recommended by EIFS manufacturer.
  5. Apply skim coating material as recommended by manufacturer at the minimum thickness required to fill in the existing surface texture and provide a flat, smooth surface ready to accept final textured finish.
    - a. If existing, maintain rustication joints clear of skim coat.
  6. Allow to dry as recommended by manufacturer.
  7. Correct any imperfections that may telegraph through the finish coat.
- K. Finish Coat: Apply over dry base coat, maintaining a wet edge at all times for uniform appearance, in thickness required by EIFS manufacturer to produce a uniform finish of color and texture matching approved sample and free of cold joints, shadow lines, and texture variations.

- L. Form 3/4 inch drip rustication joints straight and true to line, as indicated on Drawings.

### 3.4 JOINTS

- A. Install sealant at joints within system and where system abuts dissimilar materials. Apply joint sealant using sealant type, application method, and installation procedures in accordance with manufacturer's recommendation and Section 07900 and the EIFS manufacturers evaluation report. Do not seal drainage weep holes or outlets.

### 3.5 REPAIR OF DAMAGED OR NON-CONFORMING WORK

- A. Repair or correct installed work which is damaged during construction or is otherwise incomplete or not conforming to specification requirements. Repair and correction shall be in accordance with manufacturer's written and published instructions and shall be at no additional cost.

### 3.6 FIELD QUALITY CONTROL

- A. Field quality control shall be the responsibility of the Contractor in accordance with Section 01452. Except as specified as mandatory, field quality control testing and inspection shall be at the discretion of the Contractor as necessary to assure compliance with Contract requirements. Owner T&I specified in Appendix B shall not preclude Contractor's responsibility to perform similar routine, necessary, and customary testing and inspection of the methods and frequency suitable for the type of work involved.
- B. Manufacturer's On-Site Representative: A representative of the manufacturer shall visit the site prior to and during the installation of the EIFS system. Site visit shall include inspection of substrate, installation, and verification of procedure as necessary to attain assurance for the certification statement included in Exhibit A at the end of this Section.

### 3.7 OWNER TESTING AND INSPECTION (T&I)

- A. The Owner will perform testing and inspection as specified in Appendix B (Section 07243).

END OF SECTION

EXHIBIT A  
EIFS Contractor Installation Declaration Form

EIFS Contractor Name: \_\_\_\_\_

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

THE EXTERIOR INSULATION AND FINISH SYSTEM (EIFS) INSTALLED ON THE STRUCTURE LOCATED AT THE ADDRESS INDICATED BELOW CONFORMS:

TO \_\_\_\_\_ RECOMMENDED INSTALLATION PRACTICES AND  
(Insert EIFS Manufacturer Name Here)

FOR \_\_\_\_\_ AND SECTION(S) \_\_\_\_\_ OF ICC  
(Insert EIFS System name here) (Insert Appropriate Section Numbers Here)

EVALUATION REPORT NO. \_\_\_\_\_  
(Insert Applicable Report Number Here)

Address of Structure:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Product Component Names:

Adhesive(s): \_\_\_\_\_  
Fasteners (Mech.): \_\_\_\_\_  
Base Coat: \_\_\_\_\_  
Reinforcing Fabric: \_\_\_\_\_  
Finish Coat (s): \_\_\_\_\_

INSTALLATION

CONFORMS

- A. Substrate Type and Tolerance
- B. EIFS
  - 1. Adhesive and/or Fasteners
  - 2. Insulation
  - 3. Reinforcing Fabric
  - 4. Base Coat
  - 5. Finish

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- C. The information entered above is offered in testimony that the EIFS installation conforms with the EIFS manufacturer's installation methods and procedures, and the EIFS manufacturers ES report.
- D. An installation card shall be received from the Sealant Installer indicating that the sealant installation conforms with the EIFS evaluation report and sealant manufacturer's installation methods and procedures must accompany this declaration.

EIFS Contractor Company Name and Address:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Signature of Responsible Officer:

\_\_\_\_\_

Typed Name and Title of Officer:

\_\_\_\_\_

Telephone Number:

cc: Original: Building Department (Must be submitted with sealant installer declaration.)  
Copies: EIFS Manufacturer  
Wal-Mart (include in Final Closeout Submittals)  
END OF FORM

EXHIBIT B  
EIFS Sealant Contractor Installation Declaration Form

Sealant Installer Name: \_\_\_\_\_

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

THE SEALANT INSTALLED IN CONJUNCTION WITH AN EXTERIOR INSULATION AND FINISH SYSTEM (EIFS) INSTALLED ON THE STRUCTURE LOCATED AT THE ADDRESS INDICATED BELOW CONFORMS:

TO \_\_\_\_\_ and \_\_\_\_\_ RECOMMENDED  
(Insert EIFS Manufacturer Name Here) (Insert Sealant Manufacturer Name Here)

INSTALLATION PRACTICES AND SECTION(S) \_\_\_\_\_ OF ICC  
(Insert Appropriate Section Numbers Here)

EVALUATION REPORT NO. \_\_\_\_\_  
(Insert Applicable Report Number Here)

Address of Structure:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Product Component Names:

Primer(s): \_\_\_\_\_  
Sealers: \_\_\_\_\_  
Bond Breakers: \_\_\_\_\_  
Sealant Materials: \_\_\_\_\_

INSTALLATION

CONFORMS

- A. Designer's requirements, details and instructions \_\_\_\_\_
- B. Sealant Manufacturer's details and Requirements \_\_\_\_\_
- C. Exterior Insulation Manufacturer's Requirements \_\_\_\_\_
- D. The information entered above is offered in testimony that the Sealant installation conforms with the Sealant manufacturer's installation methods and procedures, and the EIFS manufacturers evaluation report.

Sealant Installer Company Name and Address:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Signature of Responsible Officer: \_\_\_\_\_

Typed Name and Title of Officer: \_\_\_\_\_

Telephone Number: ( \_\_\_\_\_ ) \_\_\_\_\_

cc: Original: Building Department (Must be submitted with EIFS contractor declaration.)  
Copies: EIFS Manufacturer  
EIFS Contractor  
Sealant Manufacturer  
Wal-Mart (include in Final Closeout Submittals)  
END OF FORM

## SECTION 07530 - MEMBRANE ROOFING

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
1. Modifications to existing roofing and flashing system for installation of signs, conduit, equipment, and piping.
  2. Membrane roofing systems, including insulation and flashing and waterproofing membranes, for building addition.
  3. Repair and maintenance of the roof after roof installation until store grand opening.
- B. Related Requirements: The following list is intended to aid in locating work related to or dependent on the scope of Work in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
1. Section 06100 - Rough Carpentry: Wood blocking and nailers.
  2. Section 07620 - Sheet Metal Flashing and Trim: Sheet metal fascia and edge trim, counter flashings, and other sheet metal.
  3. Section 07711 - Gutters and Downspouts: Interface of gutters with roofing and metal flashings.
  4. Section 07721 - Manufactured Curbs: Curbs for roof penetrations.
  5. Section 07900 - Joint Sealers.
  6. Appendix B - Inspection, Testing, and Observation by Owner. Procedures for inspection, testing, and documentation by Owner furnished testing laboratory.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. ASTM International:
1. ASTM C 1289 - Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
  2. ASTM D 4637 - EPDM Sheet Used In Single-Ply Roof Membrane.
  3. ASTM D 4434 - Polyvinyl Chloride Sheet Roofing.
  4. ASTM D 6878 - Thermoplastic Polyolefin Based Sheet Roofing.
- C. Factory Mutual Research Corporation (FM):
1. FM Approvals Building Materials Approval Guide, Chapter 3 - Approved Combinations and Assemblies
  2. FM Global Loss Prevention Data Sheet 1-28 - Design Wind Loads.
  3. FM Global Loss Prevention Data Sheet 1-29 - Roof Deck Securement and Above-Deck Components.
  4. FM Approval Standard 4450 - Class 1 Insulated Steel Deck Roofs.
  5. FM Approval Standard 4470 - Class 1 Roof Covers.
- D. Underwriters Laboratories, Inc. (UL):
1. UL - Roofing Materials and Systems Directory.
  2. UL 790 - Fire Resistance of Roof Covering Materials.
  3. UL 1256 - Fire Test of Roof Deck Construction.

## 1.3 SYSTEM DESCRIPTION

- A. Single Ply Membrane Roofing System: Single ply membrane roofing system consisting of insulation on metal deck with 60 mil reinforced membrane mechanically fastened.
- B. Flashing and Waterproofing Membranes: 60 mil reinforced membrane, fully adhered, as defined herein and indicated on the drawings.

## 1.4 SUBMITTALS

07530-1

- A. Comply with the requirements of Section 01330. Submit required submittals within 30 days after contract award. Submittals shall be available at all times to the Owner's Construction Manager.
- B. Product Data: Submit Product Data and MSDS sheets for accepted system showing compliance with the specified physical properties.
- C. Shop Drawing: Submit Shop Drawings showing:
  - 1. Fastener patterns to meet uplift requirements.
  - 2. Layouts for Crickets and saddles.
  - 3. Walk pad layouts.
  - 4. Details required for completion but not shown and drawings.
  - 5. Techniques for nighttime or weather tie offs.
- D. Closeout Submittals: Comply with the requirements of Section 01770.
  - 1. Letter from manufacturer stating that existing warranty has not been voided by alterations performed under this contract.
  - 2. Roofing Contractor's warranty for work on existing roofing performed under this contract.
  - 3. Roofing System Warranty Form included at the end of this Section.
- E. Regulatory Requirements Documentation: Submit Factory Mutual and UL data and assembly drawings showing compliance with Quality Assurance requirements specified below. Submit letter of compliance from the manufacturer certifying compliance with referenced Factory Mutual and UL roofing system requirements.

## 1.5 REGULATORY REQUIREMENTS

- A. Roof Assembly: Comply with Factory Mutual Approvals Building Materials Approval Guide or Underwriters Laboratories, Inc. Roofing Materials and Systems Directory as specified:
  - 1. Factory Mutual: Provide roofing assembly meeting Class 1A -60 requirements for fire resistance and wind uplift in accordance with Factory Mutual Approvals Standard 4470 and Factory Mutual Global Loss Prevention Data Sheet 1-28 and Factory Mutual Global Loss Prevention Data Sheet 1-29
  - 2. Provide roof assembly meeting requirements of UL 1256 for Flame Spread developed from underside of deck and roof assembly meeting requirements of Factory Mutual Approvals Standard 4450 for Class 1 Insulated Steel Deck Roofs (construction materials calorimeter).
- B. Pre-installation Conference:
  - 1. Contractor shall convene a pre-installation conference at the site, one week prior to commencing work of this Section. Require attendance of parties directly affecting work of this Section, including, but not limited to, the Owner's representative, Contractor, Roofing Applicator and job foreman, Mechanical and Plumbing sub-contractors, Owner's Independent Roofing Inspector, and Roofing Manufacturer's Representative.
  - 2. Contractor shall notify all attendees at least two weeks prior to the conference.
  - 3. Contractor shall review preparation and installation procedures and coordinating and scheduling required with related work.
  - 4. Contractor shall record discussions of conference and decisions and agreements (or disagreements) reached, and furnish copy of record to each party attending. Review foreseeable methods and procedures related to roofing work, including the following:
    - a. Tour, inspect and discuss condition of substrate, roof drains, roof drain final locations, curbs, penetrations and other preparatory work performed by other trades.
    - b. Review structural loading limitations of deck as defined below and inspect deck for loss of flatness and for required mechanical fastening.
    - c. Review roofing system requirements (drawings, specifications and other contract documents including submittals).
    - d. Review required submittals.
    - e. Review and finalize construction schedule related to roofing work and verify availability of materials, installer's personnel, equipment, and facilities needed to make progress and avoid delays.
    - f. Review required inspections, testing, certifying, and material usage accounting procedures.
    - g. Review weather and forecasted weather conditions, and procedures for coping with unfavorable conditions, including possibility of temporary roofing (if not a mandatory requirement).
- C. Approved Roofing Subcontractors: Employ one of the following subcontractors to perform work of this Section.

07530-2



No substitutions allowed.

Baker Roofing Company	Raleigh	NC	Jaelyn Smith	919-576-4590	<a href="mailto:rhuntley@bakerroofing.com">rhuntley@bakerroofing.com</a> ; <a href="mailto:cmessina@bakerroofing.com">cmessina@bakerroofing.com</a> ; <a href="mailto:jaelyn.smith@bakerroofing.com">jaelyn.smith@bakerroofing.com</a> ; <a href="mailto:hjones@bakerroofing.com">hjones@bakerroofing.com</a>
Cedar Cove Inc	Crystal River	FL	Bobby Casey	352-564-8319	<a href="mailto:cinc0053@tampabay.rr.com">cinc0053@tampabay.rr.com</a> ; <a href="mailto:cedarcove@yahoo.com">cedarcove@yahoo.com</a>
CirSCO Commercial Industrial	Tampa	FL	Hig Rodriguez Dillinger	813-655-8080	<a href="mailto:higdillinger@cirSCO.com">higdillinger@cirSCO.com</a> ; <a href="mailto:scottdillinger@cirSCO.com">scottdillinger@cirSCO.com</a> ; <a href="mailto:jpugh@cirSCO.com">jpugh@cirSCO.com</a> ; <a href="mailto:nbartley@cirSCO.com">nbartley@cirSCO.com</a>
Clifford-Lee & Associates	Bentonville	AR	Jimmy Phillips	479-464-9255	<a href="mailto:mail@clifford-lee.com">mail@clifford-lee.com</a>
CP Rankin Inc. Roof Management & Contracting	Chalfont	PA	Craig Rankin	866-766-3322	<a href="mailto:craig@cprankin.com">craig@cprankin.com</a> ; <a href="mailto:service@cprankin.com">service@cprankin.com</a> ; <a href="mailto:swilson@cprankin.com">swilson@cprankin.com</a>
Frost Roofing, Inc.	Wapakoneta	OH	Chad Dunlap	419-739-2701	<a href="mailto:info@frost-roofing.com">info@frost-roofing.com</a>
Hollis Roofing Inc	Columbus	MS	Randy West	479-464-9255	<a href="mailto:randy@hollisroofing.com">randy@hollisroofing.com</a> ; <a href="mailto:hrriservice@hollisroofing.com">hrriservice@hollisroofing.com</a>
J3 Construction Inc	Chicago	IL	Jessica Reynolds	773-930-4038	<a href="mailto:walmart@oharasson.com">walmart@oharasson.com</a>
Jolly Roofing & Contracting Co Inc	Collierville	TN	Tabi Jolly-Agaoglu	615-927-4112	<a href="mailto:dispatch@jollyroofing.com">dispatch@jollyroofing.com</a>
Low Slope Solutions	St Petersburg	FL	Donna Holup	727-744-3739	<a href="mailto:workorders@lowslopesolutions.com">workorders@lowslopesolutions.com</a>
Mid-South Roof Systems Inc	Atlanta	GA	Geoff Mitchell	404-361-5154	<a href="mailto:service@msrs.com">service@msrs.com</a> ; <a href="mailto:dawnb@msrs.com">dawnb@msrs.com</a> ; <a href="mailto:bradb@msrs.com">bradb@msrs.com</a>
Mint Roofing Inc	Long Lake	MN	Gavin Tugana	952-473-8080	<a href="mailto:maintenance@mintroofing.com">maintenance@mintroofing.com</a>
National Roofing Partners	Coppell	TX	Kim Baxter	866-537-6034	<a href="mailto:service@nationalroofingpartners.com">service@nationalroofingpartners.com</a>
Nations Roof LLC	Mobile	AL	Nate Lee	800-444-7663	<a href="mailto:servicecenter@nationsroof.com">servicecenter@nationsroof.com</a> ; <a href="mailto:nlee@nationsroof.com">nlee@nationsroof.com</a>
North American Roofing	Tampa	FL	Curt Thomas	828-687-7767 828-551-3920	<a href="mailto:service@naroofting.com">service@naroofting.com</a>
Nu-Tec Roofing Contractors, LLC	Indianapolis	IN	Jeff Bolander	317-726-5191	<a href="mailto:walmartleaks@nutecroofing.com">walmartleaks@nutecroofing.com</a>
Partner's Commercial Roofing, LLC	Houston	TX	Colton Dutton	713-802-1111	<a href="mailto:leaks@partnersroofing.com">leaks@partnersroofing.com</a>
Pinkston-Tadd, Inc.	Dekalb	IL	Bill Ringmeier	815-739-0070	<a href="mailto:billr@pinkstontadd.com">billr@pinkstontadd.com</a>
R&B Roofing LLC	Garland	TX	Jonathan Reader	214-221-5000	<a href="mailto:jr@rbroof.com">jr@rbroof.com</a> ; <a href="mailto:vanessa@rbroof.com">vanessa@rbroof.com</a> ; <a href="mailto:teresa@rbroof.com">teresa@rbroof.com</a> ; <a href="mailto:tom@rbroof.com">tom@rbroof.com</a> ; <a href="mailto:erika@rbroof.com">erika@rbroof.com</a>
RCI Services, LLC (Roofing)	Manchester	GA	Beth Kimbel	479-295-7718	<a href="mailto:rciservices@rciservices-nc.com">rciservices@rciservices-nc.com</a>
Reyes Single Ply Roofing Masters Corp	Rialto	CA	Raul Reyes	909-258-2857	<a href="mailto:reyessingleply@live.com">reyessingleply@live.com</a> ; <a href="mailto:jerardo@reyessingleply.com">jerardo@reyessingleply.com</a> ; <a href="mailto:nreyessingleply@outlook.com">nreyessingleply@outlook.com</a> <a href="mailto:francisco@reyessingleply.com">francisco@reyessingleply.com</a>
Rick Shipman Construction	Dexter	MO	Bud Shipman	573-624-5065 573-820-5758, X121	<a href="mailto:rickshipman@rickshipman.com">rickshipman@rickshipman.com</a> ; <a href="mailto:dinagrubbs@rickshipman.com">dinagrubbs@rickshipman.com</a> ; <a href="mailto:budshipman@rickshipman.com">budshipman@rickshipman.com</a>

River Town Painting Co	Grandville	MI	Matt Grandy	616-530-7461	<a href="mailto:info@rivertown.pro">info@rivertown.pro</a> ; <a href="mailto:rivertown98@aol.com">rivertown98@aol.com</a>
RL Bishop & Assoc. Inc.	Shiloh	GA	Tyler Bishop	706-846-3121	<a href="mailto:service@rlbishop.net">service@rlbishop.net</a>
Roofconnect	Sheridan	AR	Kimberly Speer	870-942-5613	<a href="mailto:walmart@roofconnect.com">walmart@roofconnect.com</a>
Single-Ply Systems, Inc.	Bloomington	MN	James Russell	608-633-3626	<a href="mailto:jeanetter@singleplysystems.com">jeanetter@singleplysystems.com</a> ; <a href="mailto:jamesr@singleplysystems.com">jamesr@singleplysystems.com</a> ; <a href="mailto:natec@singleplysystems.com">natec@singleplysystems.com</a> ; <a href="mailto:sps.service.request@gmail.com">sps.service.request@gmail.com</a>

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Contractor shall make arrangements for delivery of materials in manufacturer's original unopened containers, dry, undamaged, seals and labels intact.
- B. Contractor shall store materials in weather-protected environment, clear of ground and moisture. Storage requirements for insulation are as follows:
  1. Cut or remove plastic shipping wrap from insulation.
  2. Cover with tarpaulin, shield from moistures and ultraviolet rays.
  3. Elevate minimum of 4 inches above substrate.
  4. Secure to resist high winds.
  5. Distribute insulation stored on roof deck to prevent concentrated loads.
  6. Do not install wet insulation. Insulation shall be thoroughly dry prior to installation.
- C. Store cements, primers, and caulks in heated area above 40 degrees F during cold weather and in area below 80 degrees F in warm weather.
- D. Protect adjacent materials and surfaces against damage from roofing work. Do not store materials on completed roofing.

#### 1.7 ENVIRONMENTAL REQUIREMENTS

- A. Follow industry standards for environment requirements including, but not limited to, the following:
  1. Do not apply roofing membrane during inclement weather. When air temperature is expected to fall below 40 degrees F, follow specified Cold Weather Application Procedures as specified herein.
  2. Do not apply finished roofing system to wet, damp or frozen deck surface or when precipitation is occurring.
  3. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.

#### 1.8 SEQUENCING AND SCHEDULING

- A. Contractor shall coordinate the Work with installation of associated metal counter flashings specified under other sections as the Work of this Section proceeds.
- B. Contractor shall complete installation of base flashing at roof curbs prior to setting roof top equipment.

#### 1.9 WARRANTY

- A. Verify with Owner if a warranty is in effect for the existing roofing system. Do not void warranty for existing roof by performance of work under this contract.
  1. Notify roofing system manufacturer of required alterations to existing warranted roof system, in form required by manufacturer.
  2. Prior to starting alterations, photograph the existing conditions, in compliance with roofing manufacturer's requirements. Upon completion of alterations, photograph altered roof conditions in accordance with roofing manufacturer's requirements.
  3. Submit to roofing system manufacturer all information required to maintain warranty, including description of work, drawings, photographs, specifications, etc.
  4. Obtain inspection services of existing roofing system manufacturer's representative as necessary to ensure that warranty remains in effect after completion of work under this contract.

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5. Obtain statement from roofing system manufacturer that original warranty remains in effect after completion of modifications.
- B. Provide a warranty issued by Roofing Contractor against loss of weathertightness for work on existing roofing performed under this contract, commencing at date of Substantial Completion, for a period of not less than 2 years.
- C. Provide a warranty commencing at date of Substantial Completion, on form provided at the end of this Section that includes cost of labor and materials for loss of weather tightness without financial limit for a period of 15 years.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Acceptable manufacturers: Verify existing roofing system manufacturer with Owner . Provide materials acceptable to existing roofing system manufacturer and as required to maintain existing roofing system warranty.
- B. Manufacturer Contact Information:
  1. [Carlisle SynTec](mailto:steven.benjamin@carlisesyntec.com), (800) 479-6832. Contact Steve Benjamin, National Accounts Technical Manager, (413) 262-8928, [steven.benjamin@carlisesyntec.com](mailto:steven.benjamin@carlisesyntec.com).
  2. Holcim-Elevate Roofing (formerly Firestone Building Products Company), Nashville, TN. National Accounts Representative Steven Chaves, [steven.chaves@holcim.com](mailto:steven.chaves@holcim.com), (203) 297-5841.
  3. [Johns Manville Roofing Systems](mailto:megan.keyes@jm.com), Preferred Accounts Manager Megan Keyes, [megan.keyes@jm.com](mailto:megan.keyes@jm.com), (713) 834-5600.
  4. [GAF](mailto:), (877) 423-7663.

### 2.2 SYSTEM DESCRIPTION

- A. Roofing System: Verify existing roofing system type with Owner. Provide roofing system materials of type and manufacturer to match existing system, conforming to the requirements specified herein.
  1. Roofing system of building addition shall match main building in type and manufacturer.

### 2.3 MEMBRANE PHYSICAL PROPERTIES

- A. EPDM: Cured, synthetic single-ply membrane composed of Ethylene Propylene Diene Terpolymer (EPDM) and reinforced with a polyester scrim conforming to ASTM D 4637
  1. Membrane Type: Type II, reinforced, 60 mil thickness, black, 7 1/2 ft. maximum sheet width.
- B. TPO: Thermoplastic single ply membrane composed of thermoplastic polyolefin (TPO) sheet as specified for the specific product hereinbefore and reinforced with polyester scrim conforming to ASTM D 6878.
  1. Membrane Type: Reinforced, 60 mil thickness, white (match existing membrane color), 8 ft. maximum sheet width.
- C. PVC: Thermoplastic single ply membrane composed of polyvinyl chloride (PVC) sheet as specified for the specific product herein before and reinforced with polyester scrim conforming to ASTM D4434.
  1. Membrane Type: Type II, Grade 1 or Type III, reinforced, 60 mil thickness, white (match existing membrane color), 6-1/2 foot maximum sheet width.

### 2.4 FLASHING MEMBRANE

- A. Flashing Membrane: Reinforced and non-reinforced membrane and pressure-sensitive flashing by Roofing System manufacturer, minimum 60 mils, specifically designed for use in flashing at perimeters and wall, and around projections through roofing system.

### 2.5 WATERPROOFING MEMBRANE

- A. Waterproofing Membrane: Membrane waterproofing formed into uniform, flexible sheets by Roofing System manufacturer. Reinforced, 60 mils nominal thickness.

- B. Waterproofing Flashing: Reinforced and non-reinforced membrane and pressure-sensitive flashing by Roofing System manufacturer, minimum 60 mils, specifically designed for use in flashing at perimeters and wall, and around projections through roofing system.

## 2.6 ROOF INSULATION

- A. Isocyanurate Foam Insulation: Polyisocyanurate board insulation, ASTM C 1289, Type II, felt or glass-fiber mat facer on both major surfaces, with an LTTR (Long Term Thermal Resistance) value of 17.4 for 3.0" thickness based on ASTM C1303 and CAN/ULC S770.
  - 1. Manufacturers:
    - a. InsulBase Tapered, by Carlisle.
    - b. ISO 95+ GL, by Holcim-Elevate Roofing.
    - c. ENRGY3 or ISO3 by Johns Manville.
    - d. Products meeting the specified requirements by other manufacturers as recommended by the roofing membrane manufacturer.
  - B. Insulation Assembly:
    - 1. Insulation: Isocyanurate Foam, match existing insulation thickness if attaching to existing roof area, or 3.0 inches thick if new roof is isolated from existing roof.
  - C. Roof Curb Insulation: Polyisocyanurate Foam; both faces covered with glass fiber felt; thickness to match wood nailer.
  - D. Tapered Insulation: Provide crickets, saddles, and tapered insulation of same material as roof insulation; taper to the following slopes:
    - 1. Crickets and Saddles: 1/2 inch per foot (1/4 inch per foot positive slope).
    - 2. Insulation Installed to Counter slope the Roof Structure: 1/2 inch per foot.
    - 3. Edge Taper Insulation: Adjacent to gutter assembly, slope at minimum rate of 1/2 inch per foot. Provide insulation having a starting thickness of 1 inch, tapering insulation up to match nominal roof insulation thickness.

## 2.7 ROOF PENETRATION FLASHING AND SEALS

- A. Molded Pipe Flashing: Pre-molded flexible pipe flashing as recommended and supplied by the roofing manufacturer.

## 2.8 ACCESSORIES

- A. Provide accessories as shown on the drawings and manufacturer's system accessories for a complete and warranted Roofing System, including, but not limited to, the following:
  - 1. Weathered Membrane Cleaner.
  - 2. Lap Sealant.
  - 3. Bonding Adhesive.
  - 4. Membrane Fasteners.
  - 5. Termination Bar.
  - 6. Insulation Fasteners.
  - 7. Walkway / Isolation Pads.
  - 8. Preformed Accessories including Pipe Flashings.
  - 9. Preformed Corner Patching.
  - 10. Draw Bands.
  - 11. Foam Filler Insulation: Polyurethane Expanding Foam as defined within Section 07900.
  - 12. 3-inch & 6-inch in-seam tape.
  - 13. Pressure-sensitive flashing.
  - 14. Primer.
  - 15. In-seam plates.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify deck is clean and smooth, free of depressions, waves, or projections, properly sloped to drains, valleys, and eaves. Verify flutes of steel deck are evenly spaced at intersections. Defects in the substrate surface shall be reported and documented.
- B. Verify roof openings, curbs, pipes, sleeves, ducts, or vents through roof are solidly set, cant strips, nailing strips, and reglets are in place. Verify deck is supported and tightly secured.
- C. Verify surfaces are dry and free of water, snow, and ice.

]Beginning installation means acceptance of substrate and pre-installation conference has been held with agreements reached.

### 3.2 PREPARATION

- A. Provide covers and other means of protection as necessary to protect building surfaces against damage during roofing work.
- B. Where Work will continue over finished roof membrane, protect surfaces from damage.

### 3.3 ROOF INSULATION INSTALLATION

- A. Place long edge of boards parallel to deck flutes, forming joint over solid bearing. Lay insulation units with long edge joints continuous and end joints staggered. Mechanically fasten insulation, through fire resistive layer if specified, to deck with Factory Mutual approved fasteners and plates in accordance with requirements of Factory Mutual.
  - 1. Install fasteners using drill with torque clutch; other types of drills will not be permitted.
  - 2. In no case shall the number of fasteners be less than indicated in approved submittals.
- B. Lay insulation boards to moderate contact without forcing joints. Cut insulation to fit neatly around protrusions through roof. At parapet walls, cope insulation around protrusions and embed plates; butt tight to wall, sealing conditioned building.
  - 1. Fill gaps over 1/4 inch wide with Foam Filler Insulation. After foam sets and before installation of membrane, trim foam flush with insulation surface.
- C. Place roof crickets and tapered insulation to required slope pattern in accordance with Contract Documents and manufacturer's instructions.
- D. Apply no more insulation than can be sealed with membrane in same day.
- E. Adhere a single layer of insulation to manufactured metal curbs with bonding cement.

### 3.4 ROOFING MEMBRANE APPLICATION

- A. Mechanically Fastened Membrane:
  - 1. Starting at low point of roof surface, run membrane perpendicular to roof slope. Unroll membrane over prepared substrate, lapping adjoining sheets as recommended by manufacturer.
  - 2. Mechanically fasten membrane using manufacturer's fastening system. Install fasteners in accordance with submitted engineered layout pattern to resist specified wind uplift.
  - 3. Install fasteners using drill depth sensing or torque limiting screw guns to limit under / over drive of fasteners.
    - a. Drill motors and other non-limiting drivers shall not be used.
  - 4. Seam Sealing
    - a. EPDM: Seal seams where fasteners and seam plates are used with EPDM 6-inch seam tape. Seal seams without seam plates with EPDM 3-inch in-seam tape as approved by the system manufacturer.
    - b. TPO Heat-weld seams according to the system manufacturer's recommendations, and with a minimum weld width of 1-1/2 inches.
    - c. PVC: Heat weld seams according to the system manufacturer's recommendations and with a minimum weld width of 1-1/2 inches.

- B. Cold Weather Application Procedures: When air temperature is expected to fall below 40 degrees F, follow Cold Weather Application Procedures as follows:
  - 1. Store materials in heated storage units prior to installation. Rotate adhesive, cement, and sealant containers to maintain their temperature above 40 degrees F.
  - 2. Allow membrane to relax until no wrinkles are visible.
  - 3. Allow adequate time for solvents in cements to flash off. Check dryness of applied cements before sealing joints.
  - 4. Verify that frost, dew, and other forms of moisture have evaporated prior to covering insulation with membrane to prevent entrapment of moisture within finished roof system.

### 3.5 WATER CUTOFFS AND WEATHER PROTECTION

- A. Install water cut-offs at end of day's operation to seal insulation and edge of roof membrane from moisture entry. If inclement weather appears imminent during roofing application, cease operations and protect deck, insulation, flashings, penetrations and membrane from moisture infiltration with water cutoffs. Insulation and roofing materials not so protected prior to inclement weather will be considered damaged and will be cause for rejection.
- B. Remove water cut-offs and other temporary weather protections prior to continuing roofing work. Remove materials that have been subject to moisture damage and return deck to a clean, dry condition before proceeding with roofing operations. Remove damaged materials from job site.
- C. The water cut-offs and weather protection shall not be considered a part of the final roof system specified.

### 3.6 MEMBRANE FLASHING AND ACCESSORIES

- A. Apply flexible flashings to seal membrane to vertical elements using manufacturer's standard peel and stick flashing.
  - 1. Reinforced Flashing Membrane: Where conditions permit, flash penetrations and walls with reinforced flashing membrane.
  - 2. Uncured Flashing: Limit use of uncured flashing to overlay vertical seams as required at angle changes, to flash inside and outside corners, scuppers, and other penetrations or unusually shaped walls as approved by the manufacturer.
- B. Roof Penetrations:
  - 1. Molded Pipe Flashing: Install where configuration of penetration will permit.
- C. Seal flashings and flanges of items penetrating membrane.
- D. Fasten termination bars at 12 inches on center or less to maintain constant compression.
- E. Isolation Pads: Install isolation pads at pipe supports.
- F. Walkway Pads: Install walkway pads as shown on the drawings. Maximum pad section length shall be 10 ft. with three inch spacing between pad sections, unless otherwise indicated on Drawings. Adhere pads to roofing system to prevent displacement in maximum anticipated design wind velocity and to allow drainage of moisture from beneath pads. Install pads to allow roof surface drainage without ponding water. Install pads after adjacent equipment installation.

### 3.7 WATERPROOFING MEMBRANE

- A. Waterproofing Membrane: Install waterproofing membrane to be fully adhered to parapet using bonding adhesive as recommended by membrane manufacturer. Run membrane waterproofing over top of parapet and turn down front side of parapet 3 inches.
  - 1. Provide continuous weather tight seal from 3" below parapet cap, over parapet, down interior face, and onto roof surface.
  - 2. Conceal adhesive on exterior face of parapet with waterproofing.
- B. Waterproofing Flashing: Apply waterproofing membrane flashings to seal membrane to vertical elements using manufacturer's peel and stick flashing.
  - 1. Reinforced Waterproofing Flashing: Where conditions permit, flash walls with reinforced waterproofing

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- flashing or as required by the manufacturer.
- 2. Uncured Flashing: Limit use of uncured flashing to overlay vertical seams as required at angle changes, to flash inside and outside corners, scuppers, and other penetrations or unusually shaped walls where use of reinforced waterproofing flashing is not practical or as required by the manufacturer.

3.8 FIELD QUALITY CONTROL

- A. Field quality control shall be the responsibility of the Contractor in accordance with Section 01452. Except as specified as mandatory, field quality control testing and inspection shall be at the discretion of the Contractor as necessary to assure compliance with Contract requirements. Owner T&I specified in Appendix B shall not preclude Contractor's responsibility to perform similar routine, necessary, and customary testing and inspection of the methods and frequency suitable for the type of work involved.
- B. Manufacturer's Site Inspections:
  - 1. Provide site inspection and reports by the manufacturer's representative as required by the manufacturer to maintain the existing warranty.
  - 2. Provide site inspection and reports by the manufacturer's representative for new roofing at the following periods:
    - a. At 100% completion of roof installation.
  - 3. Inspection shall conform to the inspection requirements specified herein.
  - 4. Identify defects on the Owner's Observation Log in Owner's online document delivery application *Lucernex*.
  - 5. Perform a final audit 10 months after acceptance with Owner's representative as scheduled by Owner.
- C. Take core samples and report information when determined to be necessary to verify the insulation thickness by the IRI.
- D. Correct identified defects or irregularities.

3.9 OWNER TESTING AND INSPECTION (T&I)

- A. The Owner will perform testing and inspection as specified in Appendix B (Section 07530).

3.10 CLEANING

- A. Replace defaced or disfigured finishes caused by Work of this Section.

3.11 PROTECTION

- A. Where construction traffic must continue over finished roof installation, protect roof surfaces as recommended by roofing system manufacturer to protect manufacturer's warranty.

3.12 MAINTENANCE AND REPAIR DURING CONSTRUCTION

- A. The Contractor shall maintain the entire roofing system and related work until issuance of Certificate of Occupancy. Maintenance shall consist of repair of material or installation defects or damage resulting from any subsequent work on the roof or from any weather related damage. Maintenance shall be to maintain the roof system in a watertight condition including repair of conditions that show signs of inferior workmanship that may result in potential leaks. Leaks occurring during the maintenance shall be repaired in accordance with good roofing practice and the requirements specified herein. The Contractor shall remove and replace all wet insulation caused by water leaks and repair the Roofing System.

END OF SECTION

**ROOFING SYSTEM WARRANTY**

Owner: \_\_\_\_\_

Address of Owner: \_\_\_\_\_

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Type and Name of Building: \_\_\_\_\_

Location: \_\_\_\_\_

Roofing System Specification Number: \_\_\_\_\_ Area of Roof System: \_\_\_\_\_

Date of Substantial Completion: \_\_\_\_\_ Date Warranty Expires: \_\_\_\_\_

Manufacturer's 24 hour Emergency Telephone: (\_\_\_\_) \_\_\_\_\_ (no answering machines or message Center)

Contact Name: \_\_\_\_\_

Contractor's Telephone: (\_\_\_\_) \_\_\_\_\_ (no answering machines or message center)

Contact Name: \_\_\_\_\_

Upon completion of and after inspection by the Manufacturer of such Work, Manufacturer agrees to warrantee the aforesaid Roofing System for a limited period and subject to the conditions herein set forth:

Manufacturer Warrantees, subject to the conditions herein set forth, that during a period of 15 years from the date of Substantial Completion, it will, at its own cost and expense, make or cause to be made such repairs to said Roofing System resulting solely from faults or defects in materials and/or workmanship applied by or through the Roofing System Contractor as may be necessary to maintain said Roofing system in watertight condition. Owner's remedies and manufacturer's liability shall include cost of labor and materials for loss of weather tightness without financial limit. In accordance with good roofing practice, the Manufacturer shall remove and replace all wet insulation (as defined in specifications) caused by water leaks covered under this Warranty (i.e. leaks resulting from circumstances other than those listed in the exclusions) and repair the Roofing System at no cost to the Owner. Should the investigation reveal that the leak is the result of something other than a defect in materials and/or workmanship applied by or through the Roofing System Contractor, the reasonable investigative work and reasonable repair costs shall be paid by the Owner. Failure by the Owner to pay these costs shall render this warranty null and void.

Warranty shall include materials and workmanship from the following items:

1. Membranes (including parapet waterproofing).
2. Membrane flashings including attachment to sheet metal flashings and trim.
3. Fasteners, cements, and adhesives.

This warranty is made subject to the following conditions:

1. The Owner shall notify Manufacturer within 24 hours of notice by the Walmart Roof Maintenance Department of leaks. The Manufacturer will respond with service within 24 hours of notice from owner (if not possible, than no later than 48 hours; however Owner retains the right to make repairs at Warrantor's expense to mitigate damages).
2. Specifically excluded from this Warranty is any and all damage to said roof system, the building, or contents caused by natural disasters, including, but not limited to: earthquake, hail, lightning, hurricane, tornado, strong gale wind force (72 MPH or greater), or structural failure of the building or of the roof deck (as defined by a licensed Structural Engineer and except that caused by the Manufacturer), fire, and acts of war. If the roof system is damaged by reason of any of the foregoing, this warranty shall become null and void (AFFECTED AREAS ONLY) for the balance of the warranty period unless such damage is repaired at the expense of the owner.
3. Manufacturer is not liable for consequential damages to the building or contents resulting from any defects in said roof system, including, but without limitation, any interruption of business experienced by Owner or occupants of the building.
4. All additions and/or alterations to the roof system shall be installed in accordance with the manufacturer's written recommendations and the manufacturer should provide prior to acceptance to said additions or alterations. Should unauthorized additions/alterations be discovered by the Walmart Roof Maintenance Department, the manufacturer will be notified in writing within fourteen days of such discovery. Provide at manufacturer's discretion an inspection of the unauthorized additions/alterations and notify the Owner in writing of any remedy required by the manufacturer within fourteen days. This Installation/Inspection by the Manufacturer is to be done at a cost to Owner of not more than \$500.00 to cover travel and time for the inspector. Provide inspection of said roof during business hours. Failure to notify the Owner of any required remedy shall deem the addition/alteration acceptable to the Manufacturer and the warranty will remain in effect.
5. The area of additions and/or alterations shall be the only area of the roof system where warranty is suspended. All other roof system areas will have continual coverage under the roof warranty.

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6. This Warranty is transferable within the 15-year warranty period, subject to Manufacturer's inspection, written approval and transfer fee payment.
7. During the term of this warranty, the manufacturer, its agents and employees, shall have free and unlimited access to the roof during the hours of store operation.
8. The terms and conditions of this warranty are controlling. Any other warranty conditions attached or referenced that are in conflict with this warranty are ineffective and invalid.
9. This limited warranty shall be governed and construed in accordance with the laws of the State of Arkansas without regard to conflict of laws.
10. The Manufacturer does not warrant products incorporated or utilized in this installation that it has not furnished. The Manufacturer specifically disclaims liability under any theory of law arising out of the installation or performance of, or damages sustained by or caused by, products not furnished by the Manufacturer.

IN WITNESS WHEREOF, this instrument has been duly executed this \_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.

\_\_\_\_\_  
By \_\_\_\_\_

END OF WARRANTY

## ROOF INSPECTION INSTRUCTIONS

TOOLS AND SUPPLIES: Provide the following during inspections:

- Copy of roof plan and copy and specifications.
- Tape measure, metal thickness gauge, paint for marking defects on roof, roof coring tools and repair materials, and seam probe (to be supplied by Roofing Contractor).

### INSPECTION PROCEDURE

- All undersigned parties shall accompany inspection.
- Inspect underside of decking from inside of building for proper insulation fastener spacing and sheet fastener spacing.
- Roof Inspection shall start at the parapet wall on the GM side of the building, at the back corner.
- Proceed around perimeter, (including TLE, Garden Center, etc).
- Continue across front wall and down sidewall at GR.
- Inspect all metal flashings, base and wall flashings, perimeter attachments, perimeter membrane sheet layout, parapet waterproofing membrane, and all accessories.
- Inspect condition of paint on exterior walls. Inspect CMU for proper paint coverage.
- Inspect all painted metals for proper coverage.
- Inspect back wall gutter or internal drainage system.
- Inspect field of roof system, beginning approx. 10' from back wall, walking side to side of building.
- Inspect roof area no more than 10 feet on each side of walking paths, from back, to front of building.
- Inspect all checklist items at field seams, flashings, RTUs, mechanical equipment, skylights, refrigeration units, gas lines, expansion joints, crickets, walkpads, and other roof accessories.
- Mark defects on roof by paint markings and identify each defect using corresponding defect number.
- After roof inspection is complete FAX signed inspection form to Owner's Construction Manager within 24 hours.

### COMPLETION OF CHECKLIST

- Answer each checklist item Yes or No.
- Mark "N/A" on checklist items which do not apply.
- Identify defects on the Owner's Deviation Log in Owner's online document delivery application *Lucernex*.
- Number each defect as follows:
  - Identification Symbol-Checklist Item No.-Defect No. (E.g. MF-1-3)
  - Identification symbol and checklist item number shall correspond to the Roof Inspection Checklist. The defect number shall be numbered in sequence for each checklist item.
- Complete all applicable information in the Deviation Log including the resolution of each item.

**ROOF INSPECTION CHECKLIST**

**(GI) GENERAL:**

- 1. Has the specified roof system been installed? YES \_\_\_ NO \_\_\_ N/A \_\_\_
- 2. Has all construction materials, trash, and other debris been removed from the roof? YES \_\_\_ NO \_\_\_ N/A \_\_\_
- 3. Have all punch list items been addressed and signed off? YES \_\_\_ NO \_\_\_ N/A \_\_\_
- 4. Is there any visible physical damage to roof? YES \_\_\_ NO \_\_\_ N/A \_\_\_
- 5. Are the RTU's numbered so they can be seen from the roof hatch? YES \_\_\_ NO \_\_\_ N/A \_\_\_
- 6. Is the roof hatch painted? YES \_\_\_ NO \_\_\_ N/A \_\_\_
- 7. Is the any roofing mastic or other foreign substance on roof membrane? YES \_\_\_ NO \_\_\_ N/A \_\_\_

**(MF) MECHANICAL FASTENERS:** (Check from inside building)

- 1. Is the insulation attachment pattern installed per manufacturers required spacing and pattern? YES \_\_\_ NO \_\_\_ N/A \_\_\_
- 2. Is the membrane sheet attachment in the seams at minimum 12" inches o.c. or per manufacturers required spacing? YES \_\_\_ NO \_\_\_ N/A \_\_\_
- 3. Are all seams mechanically attached? YES \_\_\_ NO \_\_\_ N/A \_\_\_

**(PF) PERIMETER WALL FLASHING**

Metal Flashing Types (Check all that apply)

- Embedded edge metal
- Metal cap flashing
- Wall/Parapet
- Coping
- Other
- Pre-finished metal
- Painted metal. Paint condition:

- 1. Has the edge metal fascia been attached with fastener spacing in 3" o.c. staggered? YES \_\_\_ NO \_\_\_ N/A \_\_\_
- 2. Is the edge metal fascia continuously attached to the cleat? YES \_\_\_ NO \_\_\_ N/A \_\_\_
- 3. Is the edge metal lapped a minimum of 4"?? YES \_\_\_ NO \_\_\_ N/A \_\_\_
- 4. Have the laps been sealed? YES \_\_\_ NO \_\_\_ N/A \_\_\_
- 5. Is edge metal properly stripped into roof system? YES \_\_\_ NO \_\_\_ N/A \_\_\_
- 6. Has the metal been sealed at the flashing? YES \_\_\_ NO \_\_\_ N/A \_\_\_
- 7. Has the metal coping been fastened with neoprene gasket fasteners at 12" o.c.? YES \_\_\_ NO \_\_\_ N/A \_\_\_

**(PW) PARAPET WALL MEMBRANE**

- 1. Is the membrane fully adhered in all areas to the parapet walls? YES \_\_\_ NO \_\_\_ N/A \_\_\_
- 2. Are there any voids, wrinkles, or disbanded areas? YES \_\_\_ NO \_\_\_ N/A \_\_\_
- 3. Has the termination bar been installed at the base flashing? YES \_\_\_ NO \_\_\_ N/A \_\_\_
- 4. Is the base flashing run onto the roof membrane and seam sealant used? YES \_\_\_ NO \_\_\_ N/A \_\_\_
- 5. Are corner flashings installed? YES \_\_\_ NO \_\_\_ N/A \_\_\_
- 6. Are there any open seams? YES \_\_\_ NO \_\_\_ N/A \_\_\_
- 7. Is the membrane terminated and sealed at parapet end wall conditions? YES \_\_\_ NO \_\_\_ N/A \_\_\_
- 8. Are all parapet end walls fully painted or flashed? YES \_\_\_ NO \_\_\_ N/A \_\_\_

**(PA) PERIMETER MEMBRANE SHEETS ATTACHMENT**

- 1. Have the required number perimeter sheets per system specification been installed? YES \_\_\_ NO \_\_\_ N/A \_\_\_
- 2. Are the fasteners spaced per the manufacturers requirements? YES \_\_\_ NO \_\_\_ N/A \_\_\_
- 3. Have T-Lap patches been installed at all T-joints? YES \_\_\_ NO \_\_\_ N/A \_\_\_
- 4. Have seams been properly sealed? YES \_\_\_ NO \_\_\_ N/A \_\_\_

**(EW) EXTERIOR WALL PAINT** (Inspect every 25' minimum.)

- 1. Is wall painted/sealed? YES \_\_\_ NO \_\_\_ N/A \_\_\_
- 2. Are there visible voids in the paint? YES \_\_\_ NO \_\_\_ N/A \_\_\_
- 3. Cracks in blocks or open mortar joints? YES \_\_\_ NO \_\_\_ N/A \_\_\_
- 4. Are walls painted behind downspouts? YES \_\_\_ NO \_\_\_ N/A \_\_\_

**DRAINAGE SYSTEM** (Check all that apply)

- Gutters and downspouts
- Interior drains     Overflow drains     Overflow scuppers
- Scuppers with leaders & downspouts     Overflow scuppers

Specified gauge (Check all areas with gauge)

- Main roof area \_\_\_\_\_ gauge \_\_\_\_\_
- TLE \_\_\_\_\_ gauge \_\_\_\_\_
- Garden Center \_\_\_\_\_ gauge \_\_\_\_\_
- Receiving \_\_\_\_\_ gauge \_\_\_\_\_
- Other \_\_\_\_\_ gauge \_\_\_\_\_

**(GD) GUTTERS AND DOWNSPOUTS**

- |  |         |        |         |
|--|---------|--------|---------|
| 1. Is the specified type of metal installed?                                     | YES ___ | NO ___ | N/A ___ |
| 2. Is the gutter sized as indicated on the drawings?                             | YES ___ | NO ___ | N/A ___ |
| 3. Is gutter holding water?  | YES ___ | NO ___ | N/A ___ |
| 4. Is the gutter painted inside?   | YES ___ | NO ___ | N/A ___ |
| 5. Are gutter straps installed every 36" o.c.?                                   | YES ___ | NO ___ | N/A ___ |
| 6. Gutter expansion joints installed every 40' maximum?                          | YES ___ | NO ___ | N/A ___ |
| 7. Are the gutter outlets soldered to the gutter?                                | YES ___ | NO ___ | N/A ___ |
| 9. Are gutter brackets installed every 36" o.c.? (Inspect from the ground level) | YES ___ | NO ___ | N/A ___ |
| 10. Are the downspouts the specified size and configuration?                     | YES ___ | NO ___ | N/A ___ |
| 11. Are the downspout straps installed at top, center, and bottom?               | YES ___ | NO ___ | N/A ___ |
| 12. Are the downspouts spaced as called out in the documents?                    | YES ___ | NO ___ | N/A ___ |
| 13. Have splash blocks been installed?   | YES ___ | NO ___ | N/A ___ |
| 14. Have the downspouts been properly tied to the storm sewer?                   | YES ___ | NO ___ | N/A ___ |
| 15. Are joints in gutter leaking?  | YES ___ | NO ___ | N/A ___ |
| 16. Are outlets in gutter leaking?   | YES ___ | NO ___ | N/A ___ |

**(RE) ROOF EDGE**

- |  |         |        |         |
|--|---------|--------|---------|
| 1. Is gravel guard properly installed?                 | YES ___ | NO ___ | N/A ___ |
| 2. Is gravel guard properly stripped into roof system? | YES ___ | NO ___ | N/A ___ |
| 3. Is gravel guard prefinished or painted?             | YES ___ | NO ___ | N/A ___ |
| 4. Is the gravel guard nailed at 3"o.c. staggered?     | YES ___ | NO ___ | N/A ___ |
| 6. Is roof edge ponding water?                         | YES ___ | NO ___ | N/A ___ |

**(DR) INTERIOR DRAINS**

- |  |         |        |         |
|--|---------|--------|---------|
| 1. Are the roof drains the specified diameter?                                     | YES ___ | NO ___ | N/A ___ |
| 2. Are the overflow drains the specified diameter?                                 | YES ___ | NO ___ | N/A ___ |
| 3. Does the roof drain outlet diameter match the diameter of the leader pipe?      | YES ___ | NO ___ | N/A ___ |
| 4. Has the roof membrane been properly trimmed inside the roof drain?              | YES ___ | NO ___ | N/A ___ |
| 5. Is the roof drain free of debris and draining properly?                         | YES ___ | NO ___ | N/A ___ |
| 6. Has the insulation been tapered around the roof drains?                         | YES ___ | NO ___ | N/A ___ |
| 7. Have the roof drains been checked for leaks inside the store?                   | YES ___ | NO ___ | N/A ___ |
| 8. Has the wire mesh and draw band been installed over the over flow drain outlet? | YES ___ | NO ___ | N/A ___ |
| 9. Are the roof drain strainers in place?  | YES ___ | NO ___ | N/A ___ |
| 10. Does ponding exist?  | YES ___ | NO ___ | N/A ___ |

**(SC) SCUPPERS**

- |   |         |        |         |
|---|---------|--------|---------|
| 1. Are scuppers the specified height and width?                                     | YES ___ | NO ___ | N/A ___ |
| 2. Are the scuppers located directly in line with the primary and over flow drains? | YES ___ | NO ___ | N/A ___ |
| 3. Are they flush with the roof?  | YES ___ | NO ___ | N/A ___ |
| 4. Does ponding exist?  | YES ___ | NO ___ | N/A ___ |
| 5. Has the scupper box been installed and sealed to the wall?                       | YES ___ | NO ___ | N/A ___ |
| 6. Are scuppers properly flashed to roof system?                                    | YES ___ | NO ___ | N/A ___ |

**(JC) JIB CRANE**

- |  |         |        |         |
|--|---------|--------|---------|
| 1. Is the jib crane located with unobstructed clear space below? | YES ___ | NO ___ | N/A ___ |
| 2. Does the jib crane appear to be usable in a safe manner?      | YES ___ | NO ___ | N/A ___ |
| 3. Is safety chain installed?                                    | YES ___ | NO ___ | N/A ___ |
| 4. Is the ladder safety chain installed?                         | YES ___ | NO ___ | N/A ___ |
| 5. Is GFI outlet installed within 6' reach of the jib hoist arm? | YES ___ | NO ___ | N/A ___ |
| 6. Are walkway protection pads installed?                        | YES ___ | NO ___ | N/A ___ |
| 7. Is parapet door in place (on raised parapet projects)?        | YES ___ | NO ___ | N/A ___ |

**(CM) CAMERA MOUNTS**

- |   |         |        |         |
|---|---------|--------|---------|
| 1. Are mounts attached and sealed to parapet wall?                              | YES ___ | NO ___ | N/A ___ |
| 2. Are penetrations installed for each mount?                                   | YES ___ | NO ___ | N/A ___ |
| 3. Are specified flashings and conduit used and installed at wire penetrations? | YES ___ | NO ___ | N/A ___ |
| 4. Is wiring for camera held off of the roof?                                   | YES ___ | NO ___ | N/A ___ |

**(RM) ROOF FIELD MEMBRANE:** (Seams should be checked in random areas for proper seals and voids. No wrinkles in seams will be acceptable.)

- |  |         |        |         |
|--|---------|--------|---------|
| 1. Has maximum width field sheet been used? (7' EPDM / 8' TPO) | YES ___ | NO ___ | N/A ___ |
| 2. Are all seams properly lapped and sealed?                   | YES ___ | NO ___ | N/A ___ |
| 3. Are T-lap patches in place at all T-Laps?                   | YES ___ | NO ___ | N/A ___ |
| 4. Are all edges of cut sheet sealed?                          | YES ___ | NO ___ | N/A ___ |
| 5. Do wrinkles exist in any laps?                              | YES ___ | NO ___ | N/A ___ |
| 6. Does any ponding exist in roof area?                        | YES ___ | NO ___ | N/A ___ |
| 7. Is membrane shingled properly with the slope of the roof?   | YES ___ | NO ___ | N/A ___ |

**(RI) ROOF INSULATION**

- |   |         |        |         |
|---|---------|--------|---------|
| 1. Is insulation the specified thickness? (To be checked when making roof cores.) | YES ___ | NO ___ | N/A ___ |
| 2. Are there visible gaps in the insulation boards?                               | YES ___ | NO ___ | N/A ___ |
| 3. Is there any ponding along horizontal insulation joints?                       | YES ___ | NO ___ | N/A ___ |
| 4. Are there any voids or missing insulation?                                     | YES ___ | NO ___ | N/A ___ |

**(RTU) ROOF TOP UNITS & REFRIGERATION UNITS FLASHINGS:**

- |   |         |        |         |
|---|---------|--------|---------|
| 1. Are base flashings fully adhered to curb?                    | YES ___ | NO ___ | N/A ___ |
| 2. Are corner flashings on curbs installed?                     | YES ___ | NO ___ | N/A ___ |
| 3. Are seams to roof membrane sealed with no voids or wrinkles? | YES ___ | NO ___ | N/A ___ |
| 4. Are crickets installed to divert water around unit?          | YES ___ | NO ___ | N/A ___ |
| 5. Are counterflashings installed and properly attached?        | YES ___ | NO ___ | N/A ___ |
| 6. Are walkpads installed as per the documents?                 | YES ___ | NO ___ | N/A ___ |
| 7. Are condensation P-traps installed on all units?             | YES ___ | NO ___ | N/A ___ |

**(SK) SKYLIGHTS:**

- |   |         |        |         |
|---|---------|--------|---------|
| 1. Are base flashings fully adhered to curb?                    | YES ___ | NO ___ | N/A ___ |
| 2. Are corner flashings on curbs installed?                     | YES ___ | NO ___ | N/A ___ |
| 3. Are seams to roof membrane sealed with no voids or wrinkles? | YES ___ | NO ___ | N/A ___ |
| 4. Are crickets installed to divert water around unit?          | YES ___ | NO ___ | N/A ___ |
| 5. Are counterflashings installed and properly attached?        | YES ___ | NO ___ | N/A ___ |
| 6. Are skylights attached to curbs at 12" o.c.?                 | YES ___ | NO ___ | N/A ___ |
| 7. Do screws have neoprene washers?                             | YES ___ | NO ___ | N/A ___ |
| 8. Are any cracks visible in domes?                             | YES ___ | NO ___ | N/A ___ |
| 9. Is there moisture between domes?                             | YES ___ | NO ___ | N/A ___ |
| 10. Are any of the units damaged?                               | YES ___ | NO ___ | N/A ___ |
| 11. Are any of the corners open?                                | YES ___ | NO ___ | N/A ___ |

**(GL) GAS LINES:**

- |   |         |        |         |
|---|---------|--------|---------|
| 1. Are gas lines painted?   | YES ___ | NO ___ | N/A ___ |
| 2. Is blocking spaced under line at 8' o.c max.?                  | YES ___ | NO ___ | N/A ___ |
| 3. Is blocking located within 2' of RTU?                          | YES ___ | NO ___ | N/A ___ |
| 4. Is blocking located within 1'-6" of each corner?               | YES ___ | NO ___ | N/A ___ |
| 5. Are protection pads under each block?                          | YES ___ | NO ___ | N/A ___ |
| 6. Are protection pads the correct size and fully adhered?        | YES ___ | NO ___ | N/A ___ |
| 7. Are pipe clamps correct sizes and installed per the documents? | YES ___ | NO ___ | N/A ___ |
| 8. Are gas pipe dirt legs touching roof?                          | YES ___ | NO ___ | N/A ___ |

**(EJ) ROOF EXPANSION JOINTS**

- |  |         |        |         |
|--|---------|--------|---------|
| 1. Is the expansion joint installed?                             | YES ___ | NO ___ | N/A ___ |
| 2. Is the joint properly terminated at the parapet at the front? | YES ___ | NO ___ | N/A ___ |
| 3. Is the joint properly terminated at the rear?                 | YES ___ | NO ___ | N/A ___ |
| 4. Is the joint properly flashed to roof system?                 | YES ___ | NO ___ | N/A ___ |
| 5. Are there any open seams?                                     | YES ___ | NO ___ | N/A ___ |

**(MI) MISCELLANEOUS ITEMS**

- |   |         |        |         |
|---|---------|--------|---------|
| 1. Are soil stacks properly flashed and clamps installed? | YES ___ | NO ___ | N/A ___ |
| 2. Are roof jacks properly flashed and collars sealed?    | YES ___ | NO ___ | N/A ___ |
| 3. Are protection pads under support?                     | YES ___ | NO ___ | N/A ___ |

ATTENDED BY:

GENERAL CONTRACTOR

\_\_\_\_\_

\_\_\_\_\_  
(Printed name and title)

ROOFING CONTRACTOR

\_\_\_\_\_

\_\_\_\_\_  
(Printed name and title)

MANUFACTURERS REP.

\_\_\_\_\_

\_\_\_\_\_  
(Printed name and title)

OWNER'S CONST MGR.

\_\_\_\_\_

\_\_\_\_\_  
(Printed name and title)

STORE MANAGER

\_\_\_\_\_

\_\_\_\_\_  
(Printed name and title)

## SECTION 07620 - SHEET METAL FLASHING AND TRIM

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
1. Fascia and roof edge trim.
  2. Counterflashing over base flashing.
  3. Metal parapet cap.
  4. Door hoods.
  5. Expansion joint covers.
  6. Refrigeration line hood.
  7. Curb covers.
- B. Related Requirements: The following list is intended to aid in locating work related to or dependent on the scope of Work in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
1. Section 04200 – Unit Masonry Assemblies: Metal reglets for masonry.
  2. Section 06100 - Rough Carpentry: Wood blocking and nailers.
  3. Section 07530 - Elastomeric Membrane Roofing: Roof penetration flashing and seals.
  4. Section 07717 - Scuppers and Downspouts.
  5. Section 07900 - Joint Sealers.
  6. Section 09900 - Paints and Coatings.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. American Architectural Manufacturers Association (AAMA):
1. AAMA 621 - Voluntary Specifications for High Performance Organic Coatings on Coil Coated Architectural Hot Dipped Galvanized (HDG) and Zinc-Aluminum Coated Steel Substrates.
- C. ASTM International (ASTM):
1. ASTM A 653 - Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  2. ASTM A 755/A - Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products.
  3. ASTM A 792/A - Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process
  4. ASTM B 749 –Lead and Lead Alloy Strip, Sheet, and Plate Products
  5. ASTM D 226 - Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
  6. ASTM D 523 - Standard Test Method for Specular Gloss
  7. ASTM D 4586 - Specification for Asphalt Roof Cement, Asbestos Free.
- D. National Roofing Contractors Association (NRCA):
1. NRCA - Low Slope Roofing Manual.
- E. Sheet Metal and Air Conditioning Contractors National Association (SMACNA):
1. SMACNA - Architectural Sheet Metal Manual, Fifth Edition, 1993.
- F. Steel Structures Painting Council (SSPC):
1. SSPC-Paint 12 - Cold-Applied Asphalt Mastic (Extra Thick Film).
  2. SSPC-Paint 20 Type II - Zinc Rich Primers - Organic.

### 1.3 QUALITY ASSURANCE

- A. Perform work in accordance with SMACNA "Architectural Sheet Metal Manual" and NRCA "Low Slope Roofing Manual" standard details and requirements.
- B. Supplier Certification: Provide certification from galvanized sheet steel supplier stating that materials conform to ATSM A 653, G90 hot-dipped galvanized steel.

### 1.4 DELIVERY, STORAGE AND HANDLING

- A. Stack preformed material to prevent twisting, bending, or abrasion, and to provide ventilation.
- B. Prevent contact with materials during storage that may cause discoloration, staining, or damage.

## PART 2 - PRODUCTS

### 2.1 SHEET MATERIALS

- A. Galvanized Steel: ASTM A 653 Commercial Quality and Lock-Forming Quality, G90 coating designation hot-dip galvanized, mill phosphatized for painting where exposed to view from ground level. Sheet metal gages shall be as shown or as follows where not shown:
  - 1. Flashing and Counter Flashing: 24 gauge.
  - 2. Fascia and Edge Trim: 24 gauge.
  - 3. Door Hood: 18 gauge.
  - 4. Expansion Joint Cover: 24 gauge.
  - 5. Curb-Mounted Refrigeration Line Hood: 22 gauge.
  - 6. Curb Cover: 20 gauge.

### 2.2 ACCESSORIES

- A. Fasteners: Galvanized steel finish exposed fasteners to match flashing metal. Furnish exposed fasteners with soft EPDM washers as manufactured by the following:
  - 1. Kwik-Pro Screws, by Hilti.
  - 2. Trugrip GT, by ITW Buildex.
- B. Sealant: Specified in Section 07900.
- C. Sealing Mastic: Single component gun grade butyl or polyurethane sealant as recommended by roofing manufacturer.
- D. Bituminous Coating: SSPC - Paint 12, solvent-type bituminous mastic, nominally free of sulfur, compounded for 15 mil dry film thickness per coat.
- E. Draw Band: Stainless steel.
- F. Underlayment:
  - 1. Asphalt Saturated Felt: ASTM D 266; No. 30 pound asphalt saturated organic roofing felt, nonperforated.
- G. Zinc-Rich Primer: SSPC-Paint 20 Type II.

### 2.3 FABRICATION

- A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
- B. Fabricate cleats of same material as sheet, interlockable with sheet.
- C. Form pieces in longest possible lengths.

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- D. Hem exposed edges on underside 1/2 inch; miter and seam corners.
  - E. Fabricate corners to form one piece with minimum 18 inches long legs; rivet for rigidity.
  - F. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.
  - G. Fabricate flashings to allow toe to extend 4 inches over roofing. Return and brake edges.
  - H. Fabricate exposed sheet metal components with provisions for thermal expansion.
  - I. Continuously weld or solder all joints in curb covers. Touch up damaged galvanizing with zinc rich primer.
- 2.4 FINISH
- A. Paint metal surfaces exposed to view from ground level in accordance with Section 09900, and as indicated on Drawings, unless otherwise shown to be prefinished.

### PART 3 - EXECUTION

#### 3.1 INSPECTION

- A. Verify roof openings, curbs, pipes, sleeves, ducts, or vents through roof are solidly set.
- B. Verify roofing membrane termination and base flashings are in place, sealed, and secure.
- C. Beginning of installation means acceptance of existing conditions.

#### 3.2 PREPARATION

- A. Field measure site conditions prior to fabricating work.
- B. Install starter and edge strips, and cleats before starting installation.

#### 3.3 INSTALLATION

- A. Install sheet metal flashing and trim in accordance with applicable details of SMACNA "Architectural Sheet Metal Manual" and NRCA "Low Slope Roofing Manual." Anchor units of work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level. Install work with laps, joints, and seams that will be permanently watertight and weatherproof.
- B. Bed flanges of metal flashings in plastic cement or sealing mastic where required for waterproof performance.
- C. Apply bituminous coating on surfaces in contact with dissimilar materials including the following:
  1. Dissimilar metals as defined in SMACNA Appendix A-3.
  2. Preservative treated wood.
- D. Roof Edge Trim:
  1. Install sheet metal edge trim in accordance with SMACNA Figure 2-1, profile as indicated on Drawings. Nail edge trim flange at 3 inches on center, in staggered pattern.
  2. Thermal Expansion Joints: Install roof edge trim in 10 foot lengths with a 1/4 inch gap joint with a 6 inch cover plate in accordance with SMACNA Figure 2-5A. Set the cover plate in sealant, nail through opening in edge trim, and loose lock to the drip edge.
  3. Corner Joints: Notch and lap. Set laps in sealant and rivet for rigidity. Space rivets at 1 inch on center.
- E. Parapet Cap Flashing – Option A:
  1. Install sheet metal fascia with cleat in accordance with SMACNA Figure 2-6, profiles and as indicated on Drawings.

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- a. Set cleat in full bed of sealant, overlaying and concealing continuous parapet waterproofing membrane.
    - b. Secure cleat to nailer at 6 inches on center.
    - c. Secure fascia to wood nailer with fasteners at 3" o.c. staggered per basic flange nailing pattern.
  - 2. Thermal Expansion Joints: Install parapet fascia in min 10 foot lengths with 4 inch lap joint in accordance with SMACNA Figure 2-5B. Set lap in sealant.
- F. Parapet Cap Flashing – Option B:
- 1. Install sheet metal coping with continuous cleat in accordance with SMACNA requirements, profiles as indicated.
    - a. Set cleat in full bed of sealant, overlaying and concealing continuous parapet waterproofing membrane.
    - b. Secure cleat at 6 inches on center to nailer.
  - 2. Install coping in accordance with SMACNA Figure 3-1 over shaped fiber board; secure roof side edge using washers screws in staggered pattern through slotted or oversized holes located at maximum 12" on-center.
  - 3. Provide coping in minimum 10 to maximum 25 foot lengths.
  - 4. Provide thermal expansion joints using joints in accordance with SMACNA Figure 3-3, Covered Plate Seam. Set lap in beds of sealant.
- G. Parapet Cap Flashing – Option C:
- 1. Where short runs of wall allow for few joints or as otherwise elected, Contractor may provide the following system in lieu of site fabricated assembly:
    - a. [Perma-Tite Double Tapered Coping System](#) by [Metal Era, LLC](#). 20 gauge galvanized steel snap-on clip system.
    - b. Color: PF-22: Matte Black by Metal Era.
- H. Expansion Joint Cover:
- 1. Roof-To-Roof Expansion Joint: Install galvanized sheet metal joint cover in accordance with NRCA Detail MB-9, profile as indicated on Drawings. Form cap pieces in sections not exceeding 12 feet and join with standing seams held in place by cleats in accordance with SMACNA Figure 5.5A.
- I. Curb-Mounted Refrigeration Line Hood: Install galvanized sheet metal hood with gasketed fasteners at 8 inches on center and as indicated on Drawings. Seal all joints in hood and pipe penetrations to provide weatherproof enclosure.
- J. Reglet and Counterflashing System:
- 1. Surfaced Mounted Reglet:
    - a. Set reglet parallel to roof line in full bed of sealant. Provide minimum 2 inch end lap at continuous elevations.
    - b. Secure to wall with neoprene/stainless steel washers and drive pins at maximum 16 inches on center.
    - c. Provide a continuous, full bead of sealant at top edge of reglet between flashing and wall. Sealant bead shall be of sufficient width to provide a 45 degree angle with vertical surface.
  - 2. Masonry Joint Reglet: Specified in Section 04200.
  - 3. Counterflashing: Provide counterflashing of the type indicated or required to match reglet system. Insert counterflashings into reglets to form tight fit. Counterflashing shall be installed in such a manner as to provide for continuous contact at base flashing with sufficient pressure at point of contact to prevent dislocation. Lap inside corners. Notch and hook-seam outside corners. Set laps and seams in sealant.
    - a. Provide minimum 2 inch end lap at continuous elevations.
    - b. Change in elevation of 4 inches, provide 8 inch end lap.
    - c. Change in elevation of 8 inches, provide 12 inch end lap.
- K. Curb Covers:
- 1. Install felt underlayment over plywood, and secure in place with galvanized roofing nails.
  - 2. Install metal cover over felt underlayment, and anchor to wood nailer on curb through vertical flange of cover using gasketed fasteners spaced 12" o.c. maximum.

END OF SECTION

## SECTION 07710 - MANUFACTURED ROOF SPECIALTIES

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes: Manufactured roof edge fascia system.
- B. Related Requirements: The following list is intended to aid in locating products and work related to or dependent on the scope in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
  - 1. Section 06100 - Rough Carpentry: Wood blocking and nailers.
  - 2. Section 07500 (NS)/07530 (RM) – Membrane Roofing: Roof substrate.
  - 3. Section 07620 - Sheet Metal Flashing and Trim: Sheet metal fascia and edge trim, counter flashings, and other sheet metal.
  - 4. Section 07711 - Gutters and Downspouts: Interface of gutters with roofing and metal flashings.
  - 5. Section 09900 – Paints and Coatings: Surface preparation of fascia where field painting is required.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. American National Standards Institute / Single Ply Roofing Industry (ANSI/SPRI):
  - 1. ANSI/SPRI/FM 4435 ES-1 – Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems.
- C. ASTM International (ASTM):
  - 1. ASTM A 153 – Zinc Coating (Hot-Dip) on iron and Steel Hardware.
  - 2. ASTM C920 – Elastomeric Joint Sealants.
  - 3. ASTM F2329 – Zinc Coating, Hot-Dip, Requirements for Application to Carbon and Alloy Steel Bolts, Screws, Washers, Nuts, and Special Threaded Fasteners.
- D. Factory Mutual Research Corporation (FM):
  - 1. FM Approval Standard 4435 – Approval Standard for Edge Systems Used with Low Slope Roofing Systems.
  - 2. FM Loss Prevention Data Bulletin 1-49.

## 1.3 PERFORMANCE REQUIREMENTS

- A. FM Approvals' Listing: Manufacture and install roof edge fascia that are listed in FM Approvals' "RoofNav" and approved for windstorm classification, Class 1-60. Identify materials with FM Approvals' markings.
- B. SPRI Wind Design Standard: Manufacture and install copings tested according to SPRI ES-1 and capable of resisting the following design pressures:
  - 1. Design Pressure: As indicated on Drawings.

## 1.4 QUALITY ASSURANCE

- A. Florida and HVHZ Building Code:
  - 1. Roof edge fascia systems shall have Florida Building Code (FBC) Product Approval, Miami-Dade County Product Control Notice of Acceptance (NOA), or the product approval of any other state or local Authorities Having Jurisdiction in the project location. Product approvals meeting the requirements of the current building code are necessary to obtain permits required for acceptance of work by Jurisdictional Authorities.
  - 2. Provide roof edge fascia system approved for design pressures calculated in accordance with the Florida Building Code bearing FBC Product Approval numbers or Miami-Dade County NOA numbers for intended

applications and functions of exterior assembly. Provide roof edge fascia system tested as an assembly using components stated in product approval documents.

3. Verify acceptance of product approvals by Authorities Having Jurisdiction before fabrication or delivery. The various systems, in their fabrication and installation, shall comply with the approval acceptance criteria and supporting drawings and documentation.
4. Verify products or assemblies have product approval, that product approval numbers are valid and current, and that related construction assemblies and components are used to ensure approval by Authorities Having Jurisdiction. Where approval document numbers specified herein or associated products are not current or not otherwise applicable, notify the Architect by Request for Information (RFI) for clarification.
5. Approval criteria shall take precedence over specific product models and product requirements specified herein. Where components and characteristics associated with the approval documents differ with the requirements stated herein, the approved requirements shall govern and shall be provided.

B. Pre-installation Conference: Conduct conference at Project site.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Transport, handle, store, and protect products in compliance with the requirements of Section 01600 and manufacturer's recommendations.
- B. Deliver materials in manufacturer's original unopened containers, dry and undamaged with seals and labels intact.
- C. Store cements, primers, and caulks in heated area above 40 degrees F during cold weather and in area below 80 degrees F in warm weather.
- D. Do not store materials on completed roofing.

#### 1.6 WARRANTY

- A. Special Warranty on Factory Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace roof specialties that show evidence of deterioration of factory-applied finishes within 20 years from date of Substantial Completion.
- B. Utilize edge metal included in roof membrane system manufacturer's warranty.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements and to the extent specified hereinafter, provide products by the following manufacturers:
  1. [Carlisle SynTec](mailto:steven.benjamin@syntec.carlisle.com), Steve Benjamin, Technical Manager, Strategic Accounts Group, (413) 262-8928 [steven.benjamin@syntec.carlisle.com](mailto:steven.benjamin@syntec.carlisle.com).
  2. Holcim-Elevate Roofing (formerly Firestone Building Products Company), Nashville, TN. Matt Palmersheim, National Accounts Representative, (317) 285-9674, [palmersheimmatt@firestonebp.com](mailto:palmersheimmatt@firestonebp.com).
  3. [Johns Manville Roofing Systems](http://www.johnsmanville.com), Preferred Accounts Manager Megan Keyes, [megan.keyes@jm.com](mailto:megan.keyes@jm.com), (713) 834-5600.
  4. [Metal-Era, Inc.](http://www.metal-era.com) Waukesha, WI, Contact: Jami Spice, Strategic Account Manager, (317) 403-9942, [Jami.Spice@Mtl-holdings.com](mailto:Jami.Spice@Mtl-holdings.com).
- B. Substitutions: Reference Section 01600.

#### 2.2 ROOF EDGE FASCIA

- A. Roof-Edge Fascia System: 24 gage steel, with finish as specified below. Manufactured, two-piece, roof-edge fascia consisting of snap-on metal fascia cover in section lengths not exceeding 12 feet and a formed rail with integral drip-

edge cleat to engage fascia cover. Provide matching corner units. Subject to compliance with requirements, provide one of the following products:

1. [SecureEdge One](#) by Carlisle.
2. [Rail Fascia](#), by Holcim-Elevate.
3. [Johns Manville Rail Fascia](#) System, by Johns Manville.
4. [Edge Systems One](#), by Metal-Era.
5. Roof edge fascia systems specified above are approved for, and may be used for Florida and other HVHZ projects, and are qualified under the following approval document:
  - a. Approval Document: Florida Building Code Product Approval Number: .
  - b. Approval Document: Approval Document: Approval Assigned by the Authorities Having Jurisdiction: .
6. Substitutions not allowed.

B. Finish: Smooth finish with factory finished baked-on fluoropolymer 2-coat coating system.

1. Manufacturer's standard 2-Coat Fluoropolymer conforming to AAMA 621. Fluoropolymer finish containing not less than 70 percent Kynar 500 PVDF resin by weight in color coat with a minimum of 0.9 mil dry film thickness. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
2. Unexposed side finish shall consist of not less than a 0.5 mil dry film thickness backer coat.
3. Color: Applicable to extent shown on the drawings.
  - a. PF-6: Match Sierra Tan by Metal Era.
  - b. PF-7: Match Medium Roman Bronze by Metal Era.
  - c. PF-11: Extra White by Metal Era.
  - d. PF-13: Match Bone White by Metal Era.
  - e. PF-14: Match P76 Walmart Medium Blue as described in Section 09900.
  - f. PF-15: Slate Gray by Metal Era.

C. Miters: Fabricated by the manufacturer.

## 2.3 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items included in metal edge kit or required by manufacturer for a complete installation.

B. Fasteners: Manufacturer's recommended fasteners, suitable for application and designed to meet performance requirements. Furnish the following unless otherwise indicated:

1. Exposed Penetrating Fasteners: Gasketed screws with hex washer heads matching color of sheet metal.
2. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Series 300 stainless steel or hot-dip zinc-coated steel according to ASTM A 153 or ASTM F 2329.

C. Elastomeric Sealant: ASTM C 920, elastomeric polymer sealant of type, grade, class, and use classifications required by roofing-specialty manufacturer for each application.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

A. General: Install roof specialties according to manufacturer's written instructions. Anchor roof specialties securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete roof-specialty systems.

1. Install roof specialties level, plumb, true to line and elevation; with limited oil-canning and without warping, jogs in alignment, buckling, or tool marks.
2. Provide uniform, neat seams with minimum exposure of solder and sealant.
3. Install roof specialties to fit substrates and to result in watertight performance.
4. Torch cutting of roof specialties is not permitted.

- 5. Install underlayment with adhesive for temporary anchorage. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches.
  
- B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
  - 1. Coat concealed side of uncoated aluminum roof specialties with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
  
- C. Expansion Provisions: Allow for thermal expansion of exposed roof specialties.
  - 1. Space movement joints at a maximum of 12 feet with no joints within 15 inches of corners or intersections unless otherwise shown on Drawings.
  - 2. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures.
  
- D. Fastener Sizes: Provide fasteners as recommended or provided by the fascia manufacturer but not less than the following minimums: fasteners of sizes that will penetrate wood blocking or sheathing not less than 1-1/4-inches for nails and not less than 3/4-inch for wood screws. Install cleats, anchor plates, and other anchoring and attachment accessories and devices with concealed fasteners.
  
- E. Seal joints with sealant as required by roofing-specialty manufacturer.
  
- F. Seal joints as required for watertight construction. Place sealant to be completely concealed in joint. Do not install sealants at temperatures below 40 deg F.

### 3.2 CLEANING AND PROTECTION

- A. Clean and neutralize flux materials. Clean off excess solder and sealants.
  
- B. Remove temporary protective coverings and strippable films as roof specialties are installed.

END OF SECTION

## SECTION 07711 (07 7113) - GUTTERS AND DOWNSPOUTS

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Gutters and downspouts, with expansion joints.
  - 2. Downspout collectors.
  - 3. Scuppers.
  - 4. Conductor heads.
  
- B. Related Requirements: The following list of items is intended to aid in locating products and work related to or dependent on the scope in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
  - 1. Section 07620 - Sheet Metal Flashings and Trim.
  - 2. Section 07710 – Manufactured Roof Specialties: Roof edge fascia system.
  - 3. Section 07900 - Joint Sealers.
  - 4. Section 09900 - Paints and Coatings: Field painting of metal surfaces.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
  
- B. American Architectural Manufacturers Association (AAMA)
  - 1. AAMA 621 - High Performance Organic Coatings on Coil Coated Architectural Hot Dipped Galvanized (HDG) & Zinc-Aluminum Coated Steel Substrates
  
- C. ASTM International (ASTM):
  - 1. ASTM A 653 - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - 2. ASTM A 755 - Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products
  - 3. ASTM A 792 - Steel Sheet, 55 % Aluminum-Zinc Alloy-Coated by the Hot-Dip Process
  
- D. Sheet Metal and Air Conditioning Contractors National Association (SMACNA):
  - 1. Architectural Sheet Metal Manual.
  
- E. Steel Structures Painting Council (SSPC):
  - 1. SSPC - Paint 12 - Cold-Applied Asphalt Mastic (Extra Thick Film).

## 1.3 QUALITY ASSURANCE

- A. Nominal sizing of components for rainfall intensity determined by a storm occurrence of 1 in 5 years shall be as indicated on Drawings.

## 1.4 DELIVERY, STORAGE AND HANDLING

- A. Stack preformed materials to prevent twisting, bending, or abrasion, and to aid ventilation. Slope to drain.
  
- B. Prevent contact with materials during storage which may cause discoloration, staining, or damage.

## PART 2 - PRODUCTS

## 2.1 MATERIALS

- A. Galvanized Steel Sheet: ASTM A 653 Structural Quality, Grade 33, G90 zinc coating, mill phosphatized for painting where exposed to view from ground level. Sheet metal components shall be galvanized steel sheet unless otherwise specified.
  - 1. Thermoplastic (TPO) Coated Sheet Metal for Through Wall Scuppers: ASTM A 653, Type B Commercial Steel, 24 gage, G90 zinc coating, with a layer of .035 inch min non-reinforced membrane flashing. Color to match TPO roof color.
    - a. Sure-Weld Coated Metal by Carlisle or equivalent.

## 2.2 COMPONENTS

- A. Hanging Gutters: Fabricate to cross section indicated, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in minimum 96-inch long sections. Furnish flat-stock gutter spacers and gutter brackets fabricated from same metal as gutters, of size recommended by SMACNA but not less than twice the gutter thickness. Fabricate expansion joints, expansion-joint covers, and gutter accessories from same metal as gutters. SMACNA rectangular profile, Figure 1-2, Style D, gauge as follows:
  - 1. 8"x 8" or larger: 22 gauge.
  - 2. Smaller than 8" x 8": 24 gauge.
- B. Prefinished Metal Gutters: 24 gage; Aluminum-Zinc Alloy-Coated Steel Sheet, ASTM A 792/A, Class AZ50 coating designation, Grade 40, structural quality, UL90 rated panels, and prepainted by the coil-coating process to comply with ASTM A 755/A.
  - 1. Finish: Smooth panel with factory finished baked-on fluoropolymer 2-coat coating system consisting of manufacturer's standard 2-Coat Fluoropolymer conforming to AAMA 621. Fluoropolymer finish containing not less than 70 percent Kynar 500 PVDF resin by weight in color coat with a minimum of 0.9 mil dry film thickness. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
  - 2. Color: To the extent shown on Drawings or as shown on Drawings if color is not specified herein:
    - a. PF-4 (Dark Zinc): Match Lead-Cote Metallic by [Berridge Manufacturing Co.](#), San Antonio, TX, (800) 669-0009 or (210) 650-3050.
    - b. PF-15: Match Slate Gray by [Metal-Era](#), (800) 558-2162.
- C. Downspouts: 22 gauge, Class AZ50 coating designation, Grade 40, SMACNA rectangular unless otherwise indicated, mitered elbows, fully enclosed profile, SMACNA Figure 1-32B.
  - 1. Furnish with metal hangers, from same material as downspouts, and anchors.
  - 2. SMACNA 32 series profile as applicable for Climate Zone.
  - 3. Finish: Factory finished baked-on fluoropolymer 2-coat coating system consisting of manufacturer's standard 2-Coat Fluoropolymer conforming to AAMA 621. Fluoropolymer finish containing not less than 70 percent Kynar 500 PVDF resin by weight in color coat with a minimum of 0.9 mil dry film thickness. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
    - a. Color: To the extent shown on Drawings or as shown on Drawings if color is not specified herein:
      - 1) PF-15: Match Slate Gray by [MetalEra](#), (800) 558-2162.
- D. Conductor Head: SMACNA Figure 1-25F.
- E. Through-Wall Scuppers: SMACNA Figure 1-26.
- F. Overflow Scuppers: SMACNA Figure 1-30.

## 2.3 ACCESSORIES

- A. Gutter Brackets: Galvanized steel plate, 3/16 inch thick by 2 inches wide bent plate.
- B. Gutter Spacer Clip: Galvanized steel sheet, gauge to match gutter.



- C. Gutter Spacer Strap: Galvanized steel sheet size and spacing as shown.
- D. Downspout/Gutter Connections: Match gauge and profile of gutter, SMACNA Figure 1-33B, Detail 1.
- E. Downspout Straps: Match downspout material, minimum 20 gauge, SMACNA Figure 1-35G.
- F. Bituminous Coating: SSPC - Paint 12, solvent-type bituminous mastic, nominally free of sulfur, compounded for 15 mil dry film thickness per coat.
- G. Sealant: Specified in Section 07900.
- H. Splash Blocks (if indicated on Drawings): Precast concrete units, minimum 3000 psi at 28 days, with 5 percent air entrainment, size and profile to suit application.
- I. Downspout Collectors (if indicated on Drawings): Pipe material, sizes, connections, dimensions and profiles to suit downspouts and underground storm drainage system as indicated on drawings.

## 2.4 FABRICATION

- A. Form gutters and downspouts of size as indicated on Drawings.
- B. Form scuppers of size indicated on Drawings.
- C. Fabricate in accordance with SMACNA details unless otherwise shown.
- D. Provide gutter spacers at spacing shown. Fasten to front and back of gutter.
- E. Field measure site conditions prior to fabricating work.
- F. Form sections square, true, and accurate in size, in maximum possible lengths and free of distortion or defects detrimental to appearance or performance. Allow for expansion at joints.
- G. Hem exposed edges of metal.
- H. Field Finishing: Field paint gutters, downspouts, and accessories surfaces exposed to view from ground surface unless noted as prefinished or unpainted on Drawings. Paint in accordance with Section 09900.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify that surfaces are ready to receive work and conditions are acceptable.
- B. Verify surfaces behind gutters and downspouts are painted prior to installation. Gutters, downspouts, and conductor heads shall not be in place while surfaces behind such items are being painted.

### 3.2 INSTALLATION

- A. Install gutters, brackets, and accessories in accordance with SMACNA Figure 1-12 and as shown on the Drawings.
  1. Install gutters level without sags or dips to prevent ponding.
  2. Gutter Brackets: Space alternately with gutter spacers at 36 inches on center.
    - a. Attachment to Masonry: Anchor to masonry bond beam as shown. Space anchor bolts minimum of 3 inches apart.
    - b. Attachment to Steel: Weld to steel tube section with 3/16 inch by 2 inches fillet weld, both sides of bracket. Begin weld at top of bracket.
  3. Lap gutter joints 2 inches, set laps in bead of sealant, and rivet at 1 inch on center.

- B. Provide lap type gutter expansion joint in accordance with SMACNA Figure 1-6. Locate joints at a maximum spacing of 40 feet with at least one expansion joints in each segment of gutter between ends and/or downspouts.
- C. Install downspouts in accordance with SMACNA Figure 1-35 series as applicable, space straps at 48 inches on center.
- D. Install conductor heads and downspouts after application of exterior wall coating. Locate top of conductor head 1" below primary scupper opening to permit drainage.
- E. Install scuppers in accordance with SMACNA Figure 1-26 or Figure 1-30, as applicable, except as otherwise shown on the drawings. Install TPO coated metal scuppers in accordance with manufacturer's instructions. Install scuppers before installation of roofing membrane.
- F. Apply bituminous coating on backside of conductor heads, gutters, and downspouts and on other gutter, downspout, and accessories surfaces in contact with dissimilar materials, masonry, and preservative treated wood.
  - 1. Dissimilar metals as defined in SMACNA Appendix A-3.
- G. Install strainers as required.

END OF SECTION

## SECTION 07721 - MANUFACTURED CURBS

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
1. Manufactured structural metal roof curbs furnished by Owner for installation by Contractor.
  2. Manufactured non-structural metal roof curbs furnished and installed by Contractor.
  3. Coordination with manufacturers and suppliers of roof mounted items and equipment.
- B. Related Requirements: The following list is intended to aid in locating work related to or dependent on the scope of Work in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
1. Section 05120 - Structural Steel: Roof opening frames and headers.
  2. Section 05210 - Steel Joists: Joists supporting roof curbs.
  3. Section 07530 - Elastomeric Membrane Roofing: Board insulation for roof curbs.
  4. Section 07620 - Sheet Metal Flashing Trim: Sheet metal flashing installed in conjunction with roof penetration curbs.
  5. Section 15600 – Refrigeration Systems.
  6. Section 15700 - Heating, Ventilating and Air Conditioning Equipment.
  7. Section 15800 – Air Distribution: Grease duct exhaust fan curbs supplied by grease duct manufacturer.
  8. Appendix A – Products and Work By Owner or Separate Contractor (for structural curbs and skylight curb safety screens): General procedures, manufacturers, suppliers, vendor contacts, and product information for products and services by Owner.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. American Welding Society (AWS): AWS D1.1 - Structural Welding Code.
- C. ASTM International (ASTM) (applicable only for structural curb scope):
1. ASTM A 463 - Specification for Steel Sheet, Cold Rolled, Aluminum Coated Type 1 and Type 2.
  2. ASTM A 653 - Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  3. ASTM A 792 - Specification for Steel Sheet, Fifty-Five Percent Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
- D. Steel Structures Painting Council (SSPC):
1. SSPC-Paint 20 Zinc Rich Coating Type I - Inorganic and Organic.

## 1.3 DEFINITIONS

- A. Structural Roof Curb: Manufactured square or rectangular roof curb, bearing on structural steel joists or headers, designed to support equipment dead load and roof dead and live loads.
- B. Non-Structural Roof Curb:
1. Deck Penetrations - 10 Inches by 10 Inches or Less: Manufactured square or rectangular roof curb, bearing on top of metal roof deck, designed to receive sheet metal flashing skirt, not used for support of equipment.
  2. Deck Penetrations - Greater Than 10 Inches by 10 Inches: Manufactured square or rectangular roof curb bearing on structural steel angle frame, designed to support equipment dead load. Roof dead and live load supported by structural angle frame.

## 1.4 QUALITY ASSURANCE

- A. Qualifications for Welding Work: Qualify field welding operators in accordance with AWS Standard Qualification Procedures. Provide certification that field welders have satisfactorily passed AWS qualification tests within previous 12 months.
  - 1. If recertification of welders is required, provide without additional cost to Wal-Mart.
- B. Structural Curbs: Provide manufactured metal roof curbs designed by a licensed engineer. Meet or exceed Live Loads and Dead Loads as specified in this Section and as indicated on Drawings. Coordinate curb dimensions with shop drawings of equipment to be supported.

## 1.5 DELIVERY, STORAGE AND HANDLING

- A. Transport, handle, store, and protect products in compliance with the requirements of Section 01600 and manufacturer's recommendations. Receive Owner Furnished products in accordance with the requirements of Section 01600.
- B. Ship curbs to site palletized and banded.
- C. Curb manufacturer shall furnish Curb Schedule to Contractor identifying curb "Type" and roof penetration for which curb is to be used. Curb Schedule shall identify identical curbs as single "Type" (i.e. Type A - 10 ton RTU's, Type B - 5 ton RTU's, etc.). Identify each curb with "Type" designation painted in 1 inch high letters on outside face of curb.
- D. Stack curbs at site to prevent twisting, bending or permanent deformation.

## PART 2 - PRODUCTS

### 2.1 OWNER FURNISHED PRODUCTS

- A. Owner's supplier will furnish the following products as specified in Appendix A (Section 07721) for installation by the Contractor.
  - 1. Structural roof curbs (including adaptor curbs if shown) and associated wind/seismic restraint brackets (when required)

### 2.2 MANUFACTURER

- A. Non-Structural Roof Curbs: Subject to compliance with project requirements, provide prefabricated metal roof curbs manufactured by one of the following:
  - 1. AES Industries, Tallassee, AL, Contact: Chad Burt (800) 786-0402.

### 2.3 MATERIALS

- A. Sheet Steel: One of the following at Contractor's option:
  - 1. Galvanized Steel Sheet: ASTM A 653, SS (Structural Steel) Classification, Grade 33, G60 hot-dip zinc coating.
  - 2. Aluminum-Coated Steel Sheet: ASTM A 463, SS (Structural Steel) Classification, Grade 33, Type 2, T2 100 aluminum coating.
  - 3. Aluminum Zinc Alloy-Coated Steel Sheet (GAVALUME): ASTM A 792, AZ55 aluminum zinc alloy coating.
- B. Board Insulation: Specified in Section 07511, 07530, or 07550 as applicable.
- C. Wood Nailers: CCA Pressure Treated Lumber Type C, "Standard" grade lumber of any species.
- D. Zinc-Rich Primer: SSPC-Paint 20 Type II.

07721-2

- E. Deck Support Clip: Galvanized steel sheet, gauge as shown.

## 2.4 NON-STRUCTURAL ROOF CURBS (CONTRACTOR FURNISHED AND INSTALLED)

- A. Coated 18 gauge steel sheet curb sections, corners fully mitered and welded; 2 inch by 4 inch (nominal dimension) pressure treated continuous wood nailers mechanically fastened at 12 inches on center to exterior face of curb. Shop prime welded connections with zinc-rich paint complying with SSPC-Paint 20. Profile and dimensions shall be as shown.
  - 1. Web Height: Comply with local code requirements for minimum curb height, but in no case shall curb height be less than 18 inches for deck penetrations greater than 10 inches by 10 inches and not less than 14 inches for deck penetrations 10 inches by 10 inches or less as measured from top of steel roof deck to top of curb, nor shall curb height be less than 8 inches as measured from top of roof membrane to top of curb.

## 2.5 SUBSTITUTIONS

- A. Comply with the requirements of Section 01600.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install curbs in accordance with manufacturer's instructions and as indicated on Drawings. Coordinate installation with roof membrane installation requirements specified under other Sections.
- B. Roof Curbs Bearing on Steel Angles, Joists, and Headers:
  - 1. Set units in place and secure base to roof structure by welding to top chord of structural member or as otherwise indicated on Drawings.
  - 2. Secure metal deck to perimeter of curb as indicated on Drawings.
- C. Roof Curbs Bearing on Roof Deck:
  - 1. Set units in place and secure base to steel roof deck by self-tapping screw fasteners spaced at a maximum of 12 inches on center, staggered.
- D. Install wind/seismic restraint brackets prior to installation of rooftop equipment in accordance with manufacturer's recommendations.

### 3.2 COORDINATION

- A. Coordinate project requirements for custom adapting and connecting to roof curbs with manufacturers and suppliers of curb mounted items and equipment.

### 3.3 NON-STRUCTURAL ROOF CURB SCHEDULE

- A. Provide non-structural roof curbs for the following items:
  - 1. Exhaust fans, unless otherwise shown to be provided by others.
  - 2. Multiple vent pipe penetrations.
  - 3. Supply fans at Walmart Neighborhood Market.

END OF SECTION

## SECTION 07840 - FIRESTOPPING

## PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Firestopping in rated assemblies.
- B. Related Sections:
  - 1. Section 07815 - Mineral Fiber Fireproofing: Fireproofing for grease ducts.
  - 2. Section 09250 - Gypsum Board.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. ASTM International (ASTM):
  - 1. ASTM E814 - Test Methods for Fire Tests of Through Penetration Fire Stops.
- C. FM Global (FM):
  - 1. FM 4991 – Standard for the Approval of Firestop Contractors
- D. Underwriters' Laboratories, Inc. (UL):
  - 1. UL 1479 - Fire Tests of Through-Penetration Firestops.
  - 2. UL 2079 – Tests for Fire Resistance of Building Joint Systems.
  - 3. UL Fire Resistance Directory:

## 1.3 SUBMITTALS

- A. Submittals: Comply with the requirements of Section 01330.
- B. Certifications:
  - 1. Installer Qualifications. Submit documentation of Designated Responsible Individual (DRI) or letter from firestop manufacturer naming approved installer to Architect prior to commencement of firestop work.
  - 2. Manufacturer's Inspection. Submit written certification from firestop manufacturer that Manufacturer's Representative has visited Site as specified in Part 3 and Work is in accordance with manufacturer's requirements and published instructions.

## 1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Installation of firestopping shall be by a Designated Responsible Individual (DRI) in accordance with FM 4991 or shall be an approved installer by the Firestop Manufacturer.

## 1.5 DELIVERY, STORAGE AND HANDLING

- A. Transport, handle, store, and protect products in compliance with the requirements of Section 01600 and manufacturer's recommendations.

## PART 2 PRODUCTS

## 2.1 MANUFACTURERS

- A. Subject to compliance with requirements, provide firestopping products as manufactured by one of the following:

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1. Nelson Firestop Products, (800) 331-7325.
2. Hilti, Inc, (800) 879-8000.
3. RectorSeal Corporation, (800) 231-3345.
4. Specified Technologies, Inc. (STI), (800) 992-1180.
5. 3M Fire Protection Products, (800) 376-0964.
6. Tremco Firestop System, (800) 852-8173.

## 2.2 REGULATORY REQUIREMENTS

- A. Firestop materials shall have been tested with and shall be in compliance with the minimum requirements of ASTM E814, UL 1479, and UL 2079 as applicable. Products used shall be as listed below as suitable for the intended application and as required to produce the fire rating as shown on the drawings and to conform to the Firestopping Schedule of UL assemblies included at the end of this Section.

## 2.3 MATERIALS

- A. Intumescent Latex or Acrylic Sealant: Single-component, intumescent, latex or acrylic formulation.
1. LBS, by Nelson Firestop Products.
  2. FS ONE or CP 606, by Hilti.
  3. Metacaulk 950 or 1000, by RectorSeal.
  4. SpecSeal SSS100, by STI.
  5. CP 25WB+, IC 15WB, or 3000WT by 3M.
  6. TREMstop Intumescent Acrylic (IA) or Acrylic (A), by Tremco.
- B. Intumescent Wrap/Strip: Single-component, elastomeric sheet with aluminum foil on one face.
1. WRS, by Nelson Firestop Products.
  2. CP 648 Wrap Strip, by Hilti.
  3. Metacaulk Wrap Strip, by RectorSeal.
  4. SpecSeal SSWRED Wrapstrip, by STI.
  5. FS-195+ Wrap/Strip or Ultra GS, by 3M.
  6. TREMstop WS, by Tremco.
- C. Intumescent Putty: Single-component, non-hardening, dielectric, intumescent putty.
1. FSP, by Nelson Firestop Products.
  2. CP 618 Putty Stick or CP 617/617L Putty Pad, by Hilti.
  3. CP 648 Wrap Strip, by Hilti.
  4. CFS-PL Firestop Plug, by Hilti.
  5. Metacaulk Fire Rated Putty, by RectorSeal.
  6. SpecSeal Putty, by STI.
  7. Moldable Putty+, by 3M.
  8. TREMstop MP (Moldable Putty) or Putty Stick by Tremco.
- D. Silicone Sealant: Single-component, moisture-curing, silicone-based elastomeric, non-sag grade.
1. CLK N/S, by Nelson Firestop Products.
  2. CP 601S, by Hilti.
  3. Metacaulk 835, by RectorSeal.
  4. SpecSeal PEN 300, by STI.
  5. 2000+ Silicone, by 3M.
  6. FYRE SIL, by Tremco.
- E. Silicone or Polyurethane Foam: Two-Component, liquid elastomer that, when mixed, expands and cures in place to produce a flexible, nonshrinking foam.
1. SpecSeal PEN 200, by STI.
  2. CP 620 Fire Foam, by Hilti.
- F. Intumescent Collar: Factory-fabricated, intumescent collar.
1. PCS, by Nelson Firestop Products.
  2. CP 643 or CP 644, by Hilti.
  3. Metacaulk Pipe Collar, by RectorSeal.

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4. SpecSeal SSC Collars, by STI.
  5. Plastic Pipe Device, Ultra Plastic Pipe Device, Tuck In Wrap Strips, or RC-1 Collar by 3M.
  6. TREMstop D, by Tremco.
- G. Intumescent Composite Sheet, Pillows and Mortar, or Blocks: Products used to firestop large openings.
1. CPS, by Nelson Firestop Products.
  2. CFS-BL Fireblocks, by Hilti.
  3. CP 637 Firestop Mortar, by Hilti.
  4. CP 675T Firestop Board, by Hilti.
  5. SpecSeal SSB Pillows and SpecSeal SSM Firestop Compound, by STI.
  6. CS-195+ Composite Sheet, by 3M.
  7. TREMstop PS, by Tremco.
- H. Sprayable Fire-Rated Mastic: Products used to firestop construction joints.
1. CP672 Speed Spray, by Hilti.
  2. Specseal Elastomeric Spray, by STI.
  3. Firedam Spray 200, by 3M
  4. TREMstop Acrylic Spray (A-SP) by Tremco.
- I. Packing Material: Manufacturer's standard mastic, putty, ceramic fiber blanket, or mineral wool to be used as fill or backing material for firestopping.
1. Mineral Wool, by Nelson Firestop Products.
  2. Mineral Wool, by Hilti.
  3. Fire Safing or Backer Rod, by RectorSeal.
  4. Mineral Wool, by STI.
  5. Fire Barrier 5A, 615+ Duct Wrap, or PM4 Packing Material by 3M.
  6. TREMstop FS Blanket, by Tremco.
  7. CP 767 Speed Strips and CP 777 Speed Plugs, by Hilti. (preformed mineral wool designed for top of wall fluted metal deck packing material)
- J. Substitutions: Comply with the requirements of Section 01600.

### PART 3 EXECUTION

#### 3.1 PREPARATION

- A. Remove loose dirt and oil from penetration surfaces.
- B. Place hangers or damming materials in penetration to hold firestopping materials, if necessary.

#### 3.2 INSTALLATION

- A. Keep caulk and putty away from heat, open flame, sparks, or other sources of ignition during application and until product cures. Use only with adequate ventilation.
- B. Follow manufacturer charts for appropriate material to achieve required fire rating in various locations.
- C. Install firestopping at penetrations of fire rated wall materials in accordance with manufacturer's published instructions.
- D. Install firestopping at penetrations and construction joints of fire rated walls and floors in accordance with manufacturer's published instructions and in accordance with UL Fire Resistance Directory.

#### 3.3 FIELD QUALITY CONTROL

- A. Site Inspection: Upon completion of installation, , Manufacturer's Representative shall inspect installed firestopping to verify work complies with the manufacturer's requirements.



3.4 FIRESTOPPING SCHEDULE

A. Provide firestopping complying with UL assemblies specified below.

Penetration	Assembly	Nelson	Hilti	RectorSeal	STI	3M	Tremco
<b>Metal Pipe</b>	CMU Wall 8" Thick or Less	CAJ1203	CAJ 1149 or CAJ1155 or CAJ1226	CAJ1114 or CAJ1115	CAJ1079 or CAJ1217	CAJ1001 or CAJ1009	CAJ1064 or CAJ1302
	Gypsum Board Partition	WL1083 or WL1030	WL1054 or WL1058 or WL1297	WL1026 or WL1034	WL1049 or WL1079	WL1003 or WL1009	WL1278 or WL1158
<b>Non-Metallic Pipe</b>	CMU Wall 8" Thick or Less	CAJ2086	CAJ2110 or CAJ2109 or CAJ2567	WJ2025	CAJ2064 or CAJ2045	CAJ2005	CAJ2223 or CAJ2184
	Gypsum Board Partition	WL2071	WL2098 or WL2078 or WL2341	WL2104	WL2093, WL2029 or WL2288	WL2002 or WL2005	WL2083 or WL2129
<b>Cable Tray</b>	CMU Wall 8" Thick or Less	CAJ8049 or CAJ4033	CAJ4035 or CAJ4017	CAJ8043	CAJ4020 or CAJ4029	CAJ4003	CAJ4075
	Gypsum Board Partition	WL4003	WL4011 or WL4019	----	WL4005 or WL4008	WL4004	WL3043 or WL3131
<b>Insulated Metal Pipe</b>	CMU Wall 8" thick or Less	CAJ5008 or CAJ5059	CAJ5090 or CAJ5091 or CAJ5048	WJ5016 or CAJ5070	CAJ5021 or CAJ5029	CAJ5001 or CAJ5002	CAJ5121 or CAJ5111
	Gypsum Board Partition	WL5036	WL5028 or WL5029 or WL5257	WL5057	WL5014 or WL5051	WL5001	WL-5115 WL-5081
<b>Construction Gaps - Head of Wall to Roof Deck</b>	CMU Wall to Metal Deck	----	HWD0098 or HWD0181 or HWD1037	HWD0235	----	HWD0013	HWD0092
	Gyp Bd Parti'n to Metal Deck	----	HWD0042 or HWD0049	HWD0014	----	HWS0003	HWD0091
<b>Construction Gaps - Wall to Wall</b>	CMU Wall to CMU Wall	----	WWD1011 or WWD1012 or WWD1017	----	----	WWS1001	WWD1050, WWD0043, TL/PV60-01 or WWD-1052
	Gyp Bd Parti'n to Gyp Bd Parti'n	----	WWD0067	----	----	WWS0004	----

END OF SECTION

## SECTION 07900 (07 9000) - JOINT SEALERS

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
1. Owner furnished joint sealants for exterior joints in vertical surfaces and horizontal nontraffic surfaces, except as otherwise specified.
  2. Joint sealants for interior joints in vertical surfaces and horizontal nontraffic surfaces, except as otherwise specified.
  3. Joint sealants and fillers in interior concrete floor slab-on-grade joints.
  4. Owner furnished joint sealant and fillers in exterior concrete sidewalks and pavement adjacent to building.
- B. Related Requirements: The following list is intended to aid in locating work related to or dependent on the scope of Work in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
1. Section 01351 – Regulatory Compliance.
  2. Division 2 - Joint fillers and sealants for joints in sidewalk and pavement not adjacent to building.
  3. Section 04200 - Unit Masonry Assemblies: Installation of expansion joint filler (compression seal) and control joint sealer in masonry walls.
  4. Section 07240/07241 – Polymer-Based Exterior Insulation and Finish System (EIFS): Sealants associated with EIFS recommended by Manufacturer.
  5. Section 07243 - Water-Drainage Exterior Insulation and Finish System (EIFS): Sealants associated with EIFS recommended by Manufacturer.
  6. Section 07500/07530 - Membrane Roofing: Sealants associated with roofing.
  7. Section 07710 – Manufactured Roof Specialties: Sealants for roof edge fascia system.
  8. Section 07840 - Firestopping: Joint seals around penetrations of fire-rated assemblies.
  9. Section 09650 - Resilient Flooring: Joint subfloor filler for control/construction joints concealed by floor finish material.
  10. Section 09680 - Carpet: Joint subfloor filler for control/construction joints concealed by floor finish material.
  11. Section 09900 - Paints and Coatings: Protection of wall joints from painting prior to sealing.
  12. Appendix A – Products and Work by Owner or Separate Contractor: Procedures related to Owner furnished sealants.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only
- B. ASTM International (ASTM):
1. ASTM C 920 - Elastomeric Joint Sealants.
  2. ASTM C 1330 - Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.
  3. ASTM D 1056 - Flexible Cellular Materials-Sponge or Expanded Rubber.
  4. ASTM E 84 - Surface Burning Characteristics of Building Materials.
- C. Occupational Safety and Health Administration (OSHA):
1. OSHA 01926.1153 Respirable Crystalline Silica.

## 1.3 ENVIRONMENTAL REQUIREMENTS

- A. Minimize dust emissions and provide equipment that suppresses dust.

## 1.4 QUALITY ASSURANCE

- A. Interior sealants in food preparation areas shall meet the compositional requirements for use in USDA regulated facilities, as required by FDA according to 21 CFR 177.2600, and local Authorities Having Jurisdiction.

## 1.5 SCHEDULING

- A. Complete the exterior wall sealant manufacturer's Exterior Wall Sealant Order Form provided in Excel format by Walmart Facilities Services. Contact Audrey Freeman, (501) 516-6815, [audrey.freeman@walmart.com](mailto:audrey.freeman@walmart.com).
- B. Submit Order Form to Walmart Facilities Services a minimum of 3 weeks prior to beginning exterior wall sealant work.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Transport, handle, store and protect products in compliance with the requirements of Section 01600.
- B. Supplier will deliver exterior wall joint sealants to site to be received by Contractor. Coordinate product delivery and installation in compliance with the owner products delivery requirements of Section 01600.

## 1.7 PROJECT CONDITIONS

- A. Do not install solvent curing sealants in enclosed building spaces.
- B. Maintain temperature and humidity recommended by sealant manufacturer during and after installation.
- C. Do not proceed with installation of joint sealants under the following conditions:
  - 1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer.
  - 2. When joint substrates are wet.
  - 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
  - 4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

## PART 2 - PRODUCTS

### 2.1 OWNER FURNISHED PRODUCTS

- A. Products Furnished by Owner: Elastomeric exterior sealants listed in this paragraph will be furnished by the Owner through Owner's Facilities Maintenance program and specified in Appendix A (Section 07900).
  - 1. Elastomeric sealants for exterior wall (L1).
  - 2. Elastomeric sealants for concrete sidewalk or paving joint at building where joint filled with PMEJ (L2).
- B. Sealants specified in this Section other than those included above for exterior wall and paving joint shall be provided by the Contractor.

### 2.2 ELASTOMERIC SEALANTS - GENERAL

- A. General: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

### 2.3 ELASTOMERIC SEALANTS (APPLICATIONS OTHER THAN EXTERIOR WALL)

- A. Suitability for Contact with Food: Where sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600. Sealants identified as (Non-USDA) shall not be used in food preparation areas.
- B. Manufacturers:
  - 1. [Dap Products, Inc.](#), (800) 325-6180.
  - 2. [Dow Corning Corporation](#), Mary Altenburg, (989) 496-7767.
  - 3. [GE Sealants](#) (Henkel), (877) 607-7407.
  - 4. [GE Silicones](#) (Momentive Performance Materials), (877) 943-7325.

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5. [Pecora Corporation](#), (800) 355-8817.
6. [Sika Emseal](#) (formerly Emseal Expansion Joints and Precompressed Sealants), Lyndhurst, NJ, (201) 933-8800. Contact: Kevin Collins, (215) 527-0727, [collins.kevin@us.sika.com](mailto:collins.kevin@us.sika.com).
7. Sika Greenstreak Waterstops, Lyndhurst, NJ, (201) 933-8800. Contact: Kevin Collins, (215) 527-0727, [collins.kevin@us.sika.com](mailto:collins.kevin@us.sika.com).
8. [Sika USA](#) (formerly Master Builders Solutions Construction Systems US), Lyndhurst, NJ, (201) 933-8800. Contact: Kevin Collins, (215) 527-0727, [collins.kevin@us.sika.com](mailto:collins.kevin@us.sika.com).
9. [Tremco Sealants](#) Weatherproofing Division. (800) 321-7906.
10. [W. R. Meadows, Inc.](#), (847) 214-2100.

C. Polyurethane and Hybrid Sealants (USDA Certified, unless otherwise noted):

1. Hybrid Sealant #1 (P1): ASTM C920, Type S, Grade NS, Class 50, single component.
  - a. Sikaflex HY 100 by Sika.
  - b. Vulkem 116 or Dymonic FC by Tremco.
  - c. Dynatrol I-XL or Dynatrol I-XL Hybrid by Pecora.
2. Polyurethane Sealant #2 (P2): ASTM C920, Type S, Grade P, Class 25, single component.
  - a. Sikaflex SL1 by Sika.
  - b. Vulkem 45 (Non-USDA) by Tremco.
  - c. Urexpan NR-201 by Pecora.
3. Polyurethane Sealant #3 (P3): ASTM C920, Type M, Grade NS, Class 50, multi-component.
  - a. Sikaflex NP2 by Sika.
  - b. Dymeric 240FC by Tremco.
  - c. Dynatrol II (Non-USDA) by Pecora.

D. Silicone Sealants: USDA compliant, unless otherwise noted.

1. Silicone Sealant #1 (S1): ASTM C 920, Type S, Grade NS, Class 25.
  - a. Spectrem 1, Spectrem 2 or Spectrem 3 by Tremco.
  - b. 791 Silicone Perimeter Sealant (Non-USDA) by Dow.
  - c. 864 or 890 by Pecora.
  - d. Sikaflex HY 150 by Sika.
  - e. SCS2000 SilPruf(Non-USDA) by GE.
  - f. Titebond 100% Silicone Sealant by Franklin International.
2. Silicone Sealant #2 (S2): ASTM C 920, Type S, Grade NS, Class 25, mildew resistant.
  - a. Tremsil 200 by Tremco.
  - b. 898 by Pecora.
  - c. 786 Silicone Sealant (Non-USDA) by Dow.
  - d. SCS1700 Sanitary (Non-USDA) by GE.

E. Sealant Color:

1. In interior and exterior exposed areas, match color of adjacent paint color finish or other adjacent finish color if proprietary color is not otherwise specified herein.
2. In joints where plumbing fixtures meet adjacent floor and wall finishes, match color of plumbing fixture.
3. Use clear, colorless sealant where applied to stainless steel surfaces.

## 2.4 POLYURETHANE EXPANDING FOAM SEALANTS

A. Polyurethane Expanding Foam Sealant #1 (EF1): Closed-cell foam and non-flammable propellant; urea formaldehyde-free, CFC-free; UL Class 1 Foam with flame spread of 20 and smoke developed of 25 as tested in accordance with ASTM E84.

1. Touch 'n Seal Quick Cure by Dap Products.
2. Gaps and Cracks Series by GE Sealants.

## 2.5 JOINT FILLER (INTERIOR AND EXTERIOR WALL)

A. Preformed Control Joint Filler:

1. Regular Joint: 2-5/8 inches by 1-1/2 inches; flexible rubber or PVC.
  - a. RS-STANDARD Control Joint by [Hohmann & Barnard, Inc.](#), Hauppauge, NY (800) 645-0616.
  - b. Greenstreak PVC Waterstop Masonry Control Joint by Sika [Greenstreak](#).

2. Tee Joint: 2-5/8 inches by 1 inch; flexible rubber or PVC.
    - a. RS-TEE Control Joint by Hohmann & Barnard, Inc.
    - b. Greenstreak PVC Waterstop Masonry Control Joint by Sika [Greenstreak](#).
- B. Expansion Joint Filler (Compression Seal): Polyurethane foam secondary joint sealant for walls and wall systems:
1. [Backerseal](#) expanding precompressed foam by Sika Emseal Joint Systems.
  2. Willseal 600 polyurethane foam joint sealing tape by Tremco.

## 2.6 JOINT-SEALANT BACKING (INTERIOR AND EXTERIOR CMU WALL)

- A. Sealant Backing (Backer Rod): Provide sealant backings of nonstaining material and type, compatible with joint substrates, sealants, primers, and other joint fillers approved for similar applications in accordance with sealant manufacturer's written recommendations
1. Cylindrical Sealant Backings: Closed or bi-cellular backer rod conforming to ASTM C 1330 Type B or Type C, approved by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
    - a. Backer Rod for Exterior Masonry: Closed cell foam, oversized 50 percent; self-expanding.
  2. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056.
  3. The use of ASTM C Type O open cell backer rod is prohibited.
- B. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

## 2.7 INTERIOR SLAB ON GRADE JOINT SEALANT MATERIALS

- A. Isolation Joint Filler Material: Flexible closed-cell synthetic foam, non-extruding, for full depth of concrete.
1. Ceramar Flexible Foam Expansion Joint by W.R. Meadows.
  2. Deck-O-Foam Expansion Joint Filler by W.R. Meadows
- B. Elastomeric Joint Materials:
1. Sealant:
    - a. Polyurethane Sealant: No. 2 (P2) as specified above.
    - b. Color: Match color of adjacent exposed surface of concrete slab.
    - c. Sealant shall be compatible with construction material placed against it.
  2. Joint Back-Up Material:
    - a. Polyethylene Foam, 100% closed cell.
    - b. Material shall be compatible with construction material to be placed against it such as tile adhesive.
- C. Polyurea Joint Filler (PY1): Rapid setting, two-component polyurea polymer liquid of 100% solids content, Shore A Hardness 85 to 92, compatible with construction material placed against it. (USDA compliant, unless otherwise noted.)
1. [Sika Loadflex-524 EZ](#), by Sika.

## 2.8 EXTERIOR SIDEWALK AND PAVEMENT JOINT MATERIALS

- A. Joint Back-up Material: Polyethylene foam, 100% closed cell.
- B. Sealant:
1. Dow 888 by Dow.
  2. 301 NS by Pecora.
  3. Spectrum 800 or 900 by Tremco.

## 2.9 ACCESSORIES

- A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.

- B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.

## 2.10 SUBSTITUTIONS

- A. Comply with the requirements of Section 01600.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify that surfaces and joint openings are ready to receive work and field measurements are as indicated on Drawings.

### 3.2 EXTERIOR WALL JOINT PREPARATION

- A. Prepare exterior existing joints and install sealants in accordance with sealant manufacturer's recommendations:



English



Spanish

- B. Do not begin joint sealant work until wall painting work is complete. Sealed joints shall not be overcoated with paint.
- C. Fully remove existing joint sealant and backing material on exterior vertical CMU building walls prior to repainting.
- D. Clean and prime joints in accordance with manufacturer's instructions.
- E. Remove loose materials and foreign matter which might impair adhesion of sealant.
- F. Verify that new joint backing and release tapes are compatible with sealant.
- G. Protect elements surrounding work of this Section from damage or disfiguration.

### 3.3 EXTERIOR WALL INSTALLATION

- A. Install sealant in accordance with manufacturer's instructions.
- B. Measure joint dimensions and size materials to achieve required width/depth ratios.
- C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
  - 1. Do not leave gaps between ends of sealant backings.
  - 2. Do not stretch, twist, puncture, or tear sealant backings.
  - 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- D. Install bond breaker where joint backing is not used.

- E. Apply sealant within recommended temperature ranges. Consult manufacturer when sealant cannot be applied within recommended temperature ranges.
- F. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
- G. Tool joints concave.

### 3.4 INTERIOR SLAB ON GRADE JOINT SEALING AND FILLING

#### A. General:

1. Seal/fill contraction, isolation and construction joints in floor slabs and pavements, unless otherwise indicated on Drawings or specified herein.
2. Unless noted otherwise, use polyurea joint filler in floor slab contraction and construction joints.
3. Use elastomeric joint sealant in isolation joints and textured concrete joints.
4. Use pavement sealant in pavement's contraction, construction, and isolation joints.
5. Do not seal joints with materials specified herein under relatively impervious floor finish material such as resilient flooring, sheet rubber, wood, or epoxy topping . Refer to floor finish specification Section for joint subfloor requirements.
6. Do not place polyurea joint filler under resilient flooring or carpet. Reference Section 09650 or 09680 for joint subfloor filler materials and placement under floor covering.

#### B. Cleaning:

1. Immediately prior to sealing/filling, clean joints to full depth of sealant/filler in accordance with manufacturer's recommendation.
2. Use a vacuum with HEPA-rated filter to remove loose dirt, debris, saw laitance, and other foreign material from joint.
3. Clean inner joint walls mechanically using one of the following HEPA-rated filter tools as recommended by the manufacturer for maintaining dust emissions below the permissible level:
  - a. Humpback Dustless Joint Saw by Joe Due Blades & Equipment, [www.joedue.com](http://www.joedue.com).
  - b. U.S. Saws Dust Buggy Mark III Joint Cleanout Saw, available from multiple suppliers.
  - c. Gorilla Concrete Tools GCT-10 or GCT-9 Silverback by OBHC, Inc., Columbia Station, OH, (440) 236-5112.
4. Clean joint walls to the full depth of saw cuts and 2 inch minimum depth in construction joints that may have not been saw cut to create a support shelf.
5. Remove form release agent, curing compound, or other components.

#### C. General Installation:

1. Commence placing floor joint sealant / filler no sooner than 30 days after first placement of concrete.
2. If joint is wet or damp, allow joint to dry for 72 hours prior to filling.
3. Delay floor joint sealing / filling operations until facility's environmental systems have been placed in operation for 14 days.
4. Mix and install sealant and filler in accordance with manufacturer's recommendations. Use primer if recommended for specific application.
5. Choke off shrinkage crack if necessary at bottom of contraction joint or void below construction joints by the following methods.
  - a. Saw Cut Contraction Joints:
    - 1) Place 1/8 inch to 1/4 inch (maximum) layer of dry-bagged silica sand in joint to be epoxy filled. Do not use compressible backer rod. Use methods in handling sand to maintain dust emissions below the permissible level.
  - b. Construction Joints Through Slab: Fill by inserting compressible backer rod to a minimum depth of 2 inches below slab surface
6. Do not allow sealant / filler to extend over joint edges in finished condition.

#### D. Elastomeric Joint Sealant Installation:

1. Use joint back-up material.
2. Tool surface where required to provide smooth, attractive appearance and geometry recommended by sealant manufacturer.

- E. Polyurea Joint Filler Installation:
1. Cleaning: Immediately prior to filling, clean and prepare joint bottom and sidewalls as specified herein for general cleaning.
  2. Do not use joint back-up material (i.e. backer rod, sand, etc.) except below bottom of saw cut in construction joints. Provide a minimum joint filler depth of 2 inches for backer rod material.
  3. Install test sample of the polyurea joint filler to determine if filler will leave a stain, shadow, or film on slab surface.
  4. If test sample reveals stain, shadow, or film, use joint filler stain preventing film at joints to receive polyurea joint filler.
  5. Fill joint using single pass method. Fill joint full depth from bottom to top, leave slight crown at slab surface.
  6. Add extra filler prior to filler set if needed to prevent depressed areas. If concave filler is already set, abrade with wire wheel or similar tool to minimum depth of 1/4" below surface prior to refilling.
  7. Razor off crowned filler flush with floor surface after filler has sufficiently set.
  8. Remove stain preventing film (if used). Film shall be removed by joint filler installer immediately after shaving joint filler.
  9. One week prior to Grand Opening, refill joints if:
    - a. Joint filler sidewall separation or splitting exceeds 1/32 in.
    - b. Joint filler surface profile is concave, crowned, or chattered or if voids occur.
  10. Follow manufacturer's requirements for joint preparation for proper adhesion.
- F. Isolation Joints: Form isolation joints of preformed joint-filler strips (PMEJ) where indicated.
1. Extend joint fillers full width and depth of joint.
  2. Terminate joint filler or otherwise provide joint sealant cavity of not less than 1/2 inch or more than 1 inch below finished surface if joint sealant is indicated.
  3. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.
  4. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
  5. Protect top edge of joint filler during concrete placement with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.

### 3.5 EXTERIOR SIDEWALK AND PAVEMENT JOINT SEALING AND FILLING

- A. Fill and seal sidewalk and pavement joints in areas of pavement adjacent to the building. Joint filling and sealing of sidewalks and pavement not adjacent to building is specified in Division 2.
- B. Joint Fillers: Extend joint fillers full-width and depth of joint, and not less than 1/2-inch or more than 1-inch below finished surface where joint sealer is indicated. Furnish joint fillers in 1-piece lengths for full width being placed, wherever possible. Where more than 1 length is required, lace or clip joint filler sections together.
- C. Joint Sealants: Joints shall be sealed as shown and scheduled and shall be installed in accordance with manufacturer's recommendations.

### 3.6 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

### 3.7 SEALANT LOCATION SCHEDULE

- A. Provide sealants in accordance with the following schedule. Joint sealing required by the drawings or required for a complete and proper installation but not listed in the following schedule shall be sealed as necessary regardless of whether shown or scheduled. Such joints not shown or scheduled shall be sealed with sealants consistent with specified materials or as recommended by the manufacturer for the specific application.



EXTERIOR JOINTS					
	MATERIAL TO	MATERIAL	JOINT WIDTH	SEALANT TYPE	
SITE	Concrete Sidewalk Control Joint	Concrete Sidewalk	1/4"	Sidewalks adjacent to Building: See PRODUCTS Par. Otherwise: See Division 2.	
	Concrete Sidewalk Expansion Joint	Concrete Curb	1/2"	Same	
	Patterned Concrete Expansion Joint	Concrete Sidewalk	1/2"	See Division 2.	
	Concrete Paving Control Joint	Concrete Paving	1/4"	Pavement adjacent to Building: See PRODUCTS Par. Otherwise: See Division 2.	
	Concrete Paving Expansion Joint	Concrete Paving	1/2"	Same	
	Concrete Paving Expansion Joint	Concrete Stem Wall	1/2"	Same	
	Concrete Paving Expansion Joint	Concrete Floor Slab	1/2"	Same	
	Concrete Stair Expansion Joint	CMU Wall	1/2"	P1 or P3	
	Concrete Stair Expansion Joint	Concrete Stem Wall	1/2"	P1 or P3	
	Concrete Stair Expansion Joint	Concrete Paving	1/2"	P1 or P3	
	Concrete Curb Expansion Joint	Concrete Curb	1/2"	See Division 2	
	Concrete Curb Expansion Joint	CMU Wall	1/2"	Same	
	EXTERIOR BUILDING WALL	CMU Wall Expansion Joint, 3/8" or 1" (Total coatings for project over 30 gall)	CMU Wall	3/8" 1"	See Appendix A (Sect 07900)
		CMU Wall Expansion Joint, 3/8" or 1" (Total coatings for project under 30 gall)	CMU Wall	3/8" 1"	L1
EIFS Wall		CMU Wall	1/2"	P1 or P3	
EIFS Wall		Cast Concrete Shapes	1/2"	P1 or P3	
EIFS Wall Expansion Joint		EIFS Wall	1"	P1 or P3	
EIFS Cornice/Trim		EIFS Cornice/Trim	1/2"	P1 or P3	
EIFS Cornice/Trim		CMU Wall	1/2"	P1 or P3	
WALL FLASHING		Metal Flashing	Metal Flashing		S1
	Metal Flashing	CMU Wall	1/4"	P1 or P3	
	Metal Flashing	EIFS Wall	1/4"	P1 or P3	
	Metal Flashing	Aluminum Storefront Frame	1/4"	P1 or P3	
SOFFITS	Metal Soffit Panel Trim	EIFS		P1 or P3	
	Metal Soffit Panel Trim	CMU Wall		P1 or P3	
WALL PENETRATIONS	Aluminum Storefront Frame	Aluminum Storefront Frame	1/4"	P1 or P3	

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**EXTERIOR JOINTS**

	<b>MATERIAL TO</b>	<b>MATERIAL</b>	<b>JOINT WIDTH</b>	<b>SEALANT TYPE</b>
	Aluminum Storefront Frame	CMU Wall	1/4"	P1 or P3
	Aluminum Storefront Frame	EIFS Wall	1/4"	P1 or P3
	Aluminum Storefront Sill	Cast Concrete Shapes	1/4"	P1 or P3
	Aluminum Storefront Sill	Concrete Slab	1/4"	P1 or P3
	Aluminum Storefront Door Threshold	Concrete Slab		P1 or P3
	Translucent Insulated Panels	Translucent Insulated Panels	1/4"	S1
	Translucent Insulated Panels	EIFS Wall	1/4"	S1
	Translucent Insulated Panels	Metal Flashing	1/4"	S1
	Hollow Metal Door Frame	CMU Wall	1/4"	P1 or P3
	Hollow Metal Door Frame	Tube Steel Frame	1/4"	P1 or P3
	Hollow Metal Door Threshold	Concrete Slab		P1 or P3
	Steel Corner Angle Frame	CMU Wall	1/4"	P1 or P3
	Steel Pipe Through	CMU Wall	1/2"	P1 or P3
	Steel Pipe Through	EIFS Wall	1/2"	P1 or P3
	Steel Pipe Through	Concrete Wall	1/2"	P1 or P3
	Steel Conduit Through	CMU Wall	1/2"	P1 or P3
	Steel Conduit Through	EIFS Wall	1/2"	P1 or P3
	Steel Conduit Through	Concrete Wall	1/2"	P1 or P3
	Ganged Steel Conduit Through	CMU Wall	1/2"	P3
	Ganged Steel Conduit Through	EIFS Wall	1/2"	P3
	Ganged Steel Conduit Through	Concrete Wall	1/2"	P3
	PVC Pipe Through	CMU Wall	1/2"	P1 or P3
	PVC Pipe Through	EIFS Wall	1/2"	P1 or P3
	PVC Pipe Through	Concrete Wall	1/2"	P1 or P3
	Copper Pipe Through	CMU Wall	1/2"	P1 or P3
	Copper Pipe Through	EIFS Wall	1/2"	P1 or P3
	Copper Pipe Through	Concrete Wall	1/2"	P1 or P3
ROOF MEMBRANE AREA	Roofing Membrane	Roofing Membrane		See Section 07500
	Roofing Membrane	Waterproof Wall Membrane		See Section 07500
	Roofing Membrane	Metal Fascia		See Section 07500
	Roofing Membrane	Molded Pipe Flashing		See Section 07500
	Waterproof Membrane	Metal Fascia		P1 or P3
	Waterproof Membrane	Metal Plates and Bolts		P1 or P3
	Waterproof Membrane	Steel Conduit	1/2"	P1 or P3
	Skylight Flashing Joints	Skylight Flashing		S1
	Vent Flashing Joints	Vent Flashing		S1
	Smoke Vent Flashing Joints	Smoke Vent Flashing		S1
	RTU Flashing Joints	RTU Flashing		S1

EXTERIOR JOINTS				
	MATERIAL TO	MATERIAL	JOINT WIDTH	SEALANT TYPE
	Waterproof Membrane Termination Bar	CMU Wall	1/4"	S1
	Steel Gutter	Steel Gutter		S1
	Steel Gutter	Steel Downspout		S1
	Steel Downspout	Steel Downspout		S1
	Urethane Rubber Seal System	Steel Pipe/ Flue	Varies	See Section 07500
	PVC Sleeve	Sheet Metal Hood/ Closure Plate		S1
	Conduit	Sheet Metal Hood/ Closure Plate		S1
	ROOF	Roof Panel	Flue Penetration Flashing	
METAL/ FIBERGLASS PANELS	Roof Panel	Gutter		P1 or P3
	Roof Panel	End Closure		P1 or P3

INTERIOR JOINTS				
	MATERIAL TO	MATERIAL	JOINT WIDTH	SEALANT TYPE
FLOOR	Concrete Floor:	Concrete Floor		
	Contraction and Construction Joint		1/4"	See Par PRODUCTS
	Expansion Joint		3/4"	Same
	Isolation Joint		See Dwgs	Same
	Concrete Curb In Grocery	Concrete Floor		Same
	Ceramic Tile Expansion Joints	Ceramic Tile	Manuf	P1 or P3
	Quarry Tile Expansion Joints	Quarry Tile	Manuf	P1 or P3
	Floor Joints Beneath Floor Finish Materials (VCT or PVC Flooring or Carpet)			See Section 09650 (Resilient Flooring) See Section 09680 (Carpet)
	Mop Sink	Floor		P1 or P3
	Transition Strip (Korlyte)	Concrete Slab		PY1
	Sanitary Cove Base (SCB)	Floor		See Section 09655
	Wood Base	Concrete Floor		P1 or P3
WALLS	CMU Wall Control Joint, 3/8"	CMU Wall	3/8"	P1
	CMU Wall Expansion Joint, 1"	CMU Wall	1"	P1
	Rated Gypsum Board Wall Control Joint	Rated Gypsum Board Wall		
	Rated Gypsum Board Wall	Metal Roof Deck		See Section 07840 - Firestopping
	Rated Gypsum Board Wall	Rated CMU Wall		Same
	Gypsum Board	CMU Walls	3/8"	P1
	Cement Board	Cement Board		P1 or P3
	Cement Board	Gypsum Board		P1 or P3
	Ceramic Tile	Wood Trim		P1 or P3
	Ceramic Tile	Galvanized Steel		P1 or P3

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**INTERIOR JOINTS**

	<b>MATERIAL TO</b>	<b>MATERIAL</b>	<b>JOINT WIDTH</b>	<b>SEALANT TYPE</b>
		Base Trim		
	Ceramic Tile	Stainless Steel		S1 or S2
	Ceramic Tile	Ceramic Tile		P1 or P3
	Non-Fiberglass Reinforced Wall Panel (NRP)	Galvanized Steel Base Trim		S1 or S2
	Non-Fiberglass Reinforced Wall Panel (NRP)	Ceramic Tile		S1 or S2
	Stainless Steel Corner Guards	Ceramic Tile		S1 or S2
	Stainless Steel Corner Guards	Wall		S1 or S2
	Stainless Steel Backsplash	Wall		S1 or S2
	Plastic Base	Grocery Equipment Wall		P1 or P3
	Plastic Base	Ceramic Tile Wall		P1 or P3
	Plastic Base	Gypsum Board Wall		P1 or P3
	Plastic Base	Concrete Floor		P1 or P3
	Plastic Base	Quarry Tile Floor		P1 or P3
	Sanitary Cove Base (SCB)	Wall		See Section 09655
	Joists shown on the drawings to be sealed with Expanding Foam Sealant			EF1
	Wood Base	Plywood Wainscot		P1
<b>WALL PENETRATIONS</b>	Aluminum Storefront Frame	Alum Storefront Frame	1/4"	P1
	Aluminum Storefront Frame	CMU Wall	1/4"	P1
	Aluminum Storefront Frame	Gypsum Board Wall	1/4"	P1
	Aluminum Storefront Sill	Cast Concrete Shapes	1/4"	P1
	Aluminum Storefront Sill	Gypsum Board Wall	1/4"	P1
	Hollow Metal Door Frame	CMU Wall	1/4"	P1
	Hollow Metal Door Frame	Gypsum Board Wall	1/4"	P1
	Steel Structural Member Through	Gypsum Board Wall	1/4"	P1
	Steel Corner Angle Frame	CMU Wall	1/4"	P1
	Steel Pipe Through	CMU Wall	1/2"	P1
	Steel Pipe Through	Gypsum Board Wall	1/4"	P1
	Steel Conduit Through	CMU Wall	1/2"	P1
	Steel Conduit Through	Gypsum Board Wall	1/4"	P1
	PVC Pipe Through	CMU Wall	1/2"	P1
	PVC Pipe Through	Gypsum Board Wall	1/2"	P1
	Copper Pipe Through	CMU Wall	1/2"	P1
	Copper Pipe Through	Gypsum Board Wall	1/2"	P1
	Steel Pipe Through	Rated CMU Wall		See Section 07840
	Steel Pipe Through	Rated Gyp Board Wall		See Section 07840
	Steel Conduit Through	Rated CMU Wall		See Section 07840

INTERIOR JOINTS				
	MATERIAL TO	MATERIAL	JOINT WIDTH	SEALANT TYPE
	Steel Conduit Through	Rated Gyp Board Wall		See Section 07840
	PVC Pipe Through	Rated CMU Wall		See Section 07840
	PVC Pipe Through	Rated Gyp Board Wall		See Section 07840
	Copper Pipe Through	Rated CMU Wall		See Section 07840
	Copper Pipe Through	Rated Gyp Board Wall		See Section 07840
TOILET FIXTURES	Sink	Ceramic Tile Wall		S2
	Floor Mount Toilet	Ceramic Tile Floor		S2
	Wall Mount Toilet	Ceramic Tile Wall		S2
	Wall Mount Urinal	Ceramic Tile Wall		S2
GROCERY EQUIP	Pre-manufactured Freezer /Cooler	Concrete Curb		P1 or P3
	Refrigerated Case Trim	Refrigerated Case		S1 or S2
	Refrigerated Case Trim	Concrete		S1 or S2
	Stainless Steel Equipment	Non-Fiberglass Reinforced Plastic (NRP) Wall Panels		S1 or S2
	Stainless Steel Equipment	Ceramic Tile		S1 or S2
EWC	Electric Water Coolers	Wall		S1 or S2
COUNTER TOPS	Plastic Laminate Counter Tops	Gypsum Board Walls		S2
	Plastic Laminate Counter Tops	Plastic Laminate Walls		S2

END OF SECTION

## SECTION 08110 - STEEL DOORS AND FRAMES

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
1. Owner furnished steel doors, panels, frames, and accessories for installation by Contractor.
  2. Owner furnished glazed lights and glazing frames in Owner furnished hollow metal doors.
  3. Owner furnished Modular Pharmacy doors and frames for installation by Owner or Contractor as scheduled on Drawings.
- B. Related Requirements: The following list is intended to aid in locating work related to or dependent on the scope of Work in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
1. Section 01600 – Product Requirements: Contractor’s Products Lead Time Schedule.
  2. Section 04200 – Unit Masonry Assemblies: Masonry mortar fill of metal frames. Placement of anchors into wall construction.
  3. Section 08150 –Recycled Plastic Interior Man Doors. HDPE Interior non-rated man doors.
  4. Section 08337 - Coiling Counter Shutters.
  5. Section 08710 - Door Hardware: Door hardware components and coordination.
  6. Section 08800 - Glazing: Glass in steel doors and frames.
  7. Section 09250 - Gypsum Board: Door frame attachment to metal wall framing.
  8. Section 09900 - Paints and Coatings: Field painting of doors and frames.
  9. Appendix A – Products and Work by Owner or Separate Contractor: Manufacturers, suppliers, performance, and general procedures related to Owner furnished products.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. American National Standards Institute (ANSI):
1. ANSI A117.1 - Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People.
  2. ANSI A250.8 (Formerly SDI-100) - Recommended Specifications for Standard Steel Doors and Frames.
  3. ANSI A250.11 (Formerly SDI-105) - Recommended Erection Instructions for Steel Frames.
- C. ASTM International (ASTM):
1. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation
  2. ASTM A653 - Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- D. National Fire Protection Association (NFPA) (where rated doors and frames required):
1. NFPA 80 - Fire Doors and Windows.
  2. NFPA 252 - Fire Tests for Door Assemblies.
- E. Underwriters Laboratories (UL):
1. UL 10B - Fire Tests of Door Assemblies.

## 1.3 QUALITY ASSURANCE

- A. Regulatory Requirements for Rated Doors:
1. Installed Fire Rated Door Assemblies: Conform to NFPA 80, NFPA 252, and UL 10B for fire rated class, as indicated on Drawings.

2. When replacing existing fire-rated doors, verify and match rating required for opening assembly. Ensure compliance with the Building Code for fire-rated assembly for each specific opening.

#### 1.4 DELIVERY, STORAGE AND PROTECTION

- A. Product Delivery: Owner's Supplier will deliver Owner furnished products to site to be received by Contractor as specified in Section 01600.
- B. Transport, handle, store, and protect products in compliance with the requirements of Section 01600.
- C. Receive and accept products and report suspected defects and shipping discrepancies in compliance with the requirements of Section 01600.
- D. Product Packaging: Doors will be shipped in manufacturer's standard packaging with identification markings on each component or package.
- E. Product Compliance Inspection: Inspect delivered products for compliance with product descriptions in Part 2 herein. Report discrepancies to the Architect.
- F. Protect doors and frames with resilient packaging. Break seal on-site to permit ventilation.

#### 1.5 PROJECT CONDITIONS

- A. Field Measurements: Verify that field measurements are as indicated on shop drawings.
- B. Coordination: Coordinate the work with door opening construction, door frame and door hardware installation.

### PART 2 - PRODUCTS

#### 2.1 OWNER FURNISHED PRODUCTS

- A. Doors, Frames, and Accessories: Owner's Supplier will furnish door packages in assemblies as determined by Owner, including frames, hardware, and glazing as specified in Appendix A (Section 08110).

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Verify substrate conditions, opening sizes and tolerances are acceptable for proper installation.

#### 3.2 INSTALLATION

- A. Install frames in accordance with ANSI A250.11.
- B. Install doors in accordance with ANSI A250.8.
- C. Coordinate with adjacent wall construction for anchor placement.
- D. Coordinate installation of glass and glazing.
- E. Coordinate installation of doors with installation of hardware specified in Section 08710.
- F. Provide board insulation blocking at exterior hollow metal frames. Glue blocking in frame jambs (strike side and hinge side) at height indicated on Drawings.
- G. Factory install glazed light assemblies in accordance with manufacturer's published instructions for fire-rating required and compliance with referenced standards.

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- H. Vision Center Steel Pocket Door: Install doors plumb, level, and square.
  - 1. Anchor hanging hardware to steel framing, anchors or blocking built in or directly attached to substrates.
  - 2. Shim as required with concealed shims.
  - 3. Provide 1/8-inch clearance at heads, bottom, and jambs. Provide additional clearance where a threshold is shown on Drawings.
  - 4. Track Stop: Install stop in frame track so as to restrict door to 32-inch depth in pocket.
  - 5. Hardware: Install pocket door hardware and lock set hardware in accordance with manufacturer's written instructions and the following:
    - a. Mount back-to-back at center line 3-inches from edge of door at 48-inches center line to floor.

### 3.3 INSTALLATION BY OWNER'S SUPPLIER

- A. Door Openings in Modular Pharmacy Construction:
  - 1. Frames: Hollow Metal Door Frames will be pre-installed in modular wall panels by Owner's modular millwork assembly Supplier.
  - 2. Doors and Door Hardware: Owner furnished HDPE interior non-rated doors and door hardware shall be installed by Contractor in pre-installed metal door frames as scheduled on Drawings.

### 3.4 ADJUSTING AND CLEANING

- A. Test for smooth operation through full range of swing; make necessary adjustments.
- B. Coordinate adjustment of doors with installation of hardware. Adjust doors and hardware for smooth and balanced door movement. Comply with ANSI A117.1.

END OF SECTION



## SECTION 08150 – RECYCLED PLASTIC INTERIOR MAN DOORS

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Owner furnished interior non fire-rated recycled high density polyethylene (HDPE) man doors for installation by Contractor, including:
    - a. Steel door frames and frame installation accessories.
    - b. Glazed light kits, frames, and accessories.
- B. Related Requirements: The following list is intended to aid in locating products and work related to or dependent on the scope in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
  - 1. Section 08110 – Hollow Metal Doors and Frames.
  - 2. Section 08710 - Door Hardware: Door hardware coordination.
  - 3. Section 09250 - Gypsum Board: Door frame attachment to metal wall framing.
  - 4. Appendix A – Products and Work by Owner or Separate Contractor: Manufacturers, suppliers, performance, and general procedures related to Owner furnished products.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. American National Standards Institute (ANSI):
  - 1. ANSI A250.8 (Formerly SDI-100) - Recommended Specifications for Standard Steel Doors and Frames. Physical performance levels and performance testing of doors functioning similar to steel doors.
  - 2. ANSI A250.11 (Formerly SDI-105) - Recommended Erection Instructions for Steel Frames. Erection recommendations for doors functioning similar to steel doors.

## 1.3 DELIVERY, STORAGE AND PROTECTION

- A. Deliver doors palletized, packaged, or crated to provide protection during transit and storage.
- B. Handle, store, and protect products in compliance with the requirements of Section 01600 and manufacturer's recommendations. Protect doors and frames with resilient packaging. Break seal on-site to permit ventilation.

## 1.4 PROJECT CONDITIONS

- A. Field Measurements: Verify that field measurements are as indicated on shop drawings.
- B. Coordination: Coordinate the work with door opening construction, door frame and door hardware installation.

## PART 2 - PRODUCTS

## 2.1 OWNER FURNISHED PRODUCTS

- A. Doors, Frames, and Accessories: Owner's Supplier will furnish door packages in assemblies as determined by Owner, including frames, hardware, and glazing as specified in Appendix A (Section 08150).

## PART 3 - EXECUTION

## 3.1 EXAMINATION

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- A. Verify substrate conditions, opening sizes and tolerances are acceptable for proper installation.

### 3.2 INSTALLATION

- A. Install frames in accordance with ANSI A250.11.
- B. Install doors in accordance with ANSI A250.8.
- C. Do not field cut plastic doors.
- D. Do not apply field coatings of any kind to plastic door faces and components.
- E. Coordinate with adjacent wall construction for anchor placement.
- F. Coordinate installation of glass and glazing.
- G. Coordinate installation of doors with installation of hardware specified in Section 08710.
- H. Vision Center Pocket Door: Install doors plumb, level, and square.
  - 1. Anchor hanging hardware to steel framing, anchors or blocking built in or directly attached to substrates.
  - 2. Shim as required with concealed shims.
  - 3. Provide 1/8-inch clearance at heads, bottom, and jambs. Provide additional clearance where a threshold is shown on Drawings.
  - 4. Install pocket door hardware and lock set hardware in accordance with manufacturer's written instructions.

### 3.3 INSTALLATION BY OWNER'S SUPPLIER

- A. Door Openings in Modular Pharmacy Construction:
  - 1. Frames: Hollow Metal Door Frames will be pre-installed in modular wall panels by Owner's modular millwork assembly Supplier.
  - 2. Doors and Door Hardware: Owner furnished HDPE interior non-rated doors and door hardware shall be installed by Contractor in pre-installed metal door frames as scheduled on Drawings.

### 3.4 ADJUSTING

- A. Test for smooth operation through full range of swing; make necessary adjustments.
- B. Coordinate adjustment of doors with installation of hardware. Adjust doors and hardware for smooth and balanced door movement.

END OF SECTION

SECTION 08305 (08 1174) - SIDE FOLDING GRILLE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Owner furnished side folding grille for installation by Contractor.
- B. Related Requirements: The following list is intended to aid in locating work related to or dependent on the scope of Work in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
  - 1. Appendix A – Products and Work by Owner or Separate Contractor: Manufacturers, suppliers, product descriptions, installation (if applicable), and general procedures related to Owner furnished products.

1.2 DELIVERY, STORAGE AND HANDLING

- A. Transport, handle, store, and protect Owner furnished products in accordance with the requirements of Section 01600 and manufacturer’s recommendations.
- B. Store in a dry area and in a manner to prevent damage.

PART 2 - PRODUCTS

2.1 OWNER FURNISHED PRODUCTS

- A. Owner’s Supplier will furnish products and equipment within the Scope of this Section as specified in Appendix A (Section 08305).

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Construct door opening, pockets and supports for side folding grille unit assembly.
- B. Install side folding grille unit assembly in accordance with manufacturer's published instructions.
- C. Use anchorage devices to securely fasten assembly to floor and header construction and building framing without distortion or stress.
- D. Securely and rigidly brace components suspended from structure.
- E. Fit and align assembly including hardware; level and plumb, to provide smooth operation.

END OF SECTION

## SECTION 08311 (08 31 13) - ACCESS DOORS AND FRAMES

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Fire-rated and non-rated access doors and frames for walls and ceilings.
- B. Related Sections:
  - 1. Section 09250 - Gypsum Board: Openings in gypsum board ceilings.
  - 2. Section 09900 - Paints and Coatings: Field paint finish.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. ASTM International (ASTM):
  - 1. ASTM A 653 - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - 2. ASTM A 879 - Steel Sheet, Zinc Coated by the Electrolytic Process for Applications Requiring Designation of the Coating Mass on Each Surface.
  - 3. ASTM A 1008 - Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.
  - 4. ASTM E 119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
- C. National Fire Protection Association (NFPA):
  - 1. NFPA 80 - Fire Doors and Windows.
  - 2. NFPA 252 - Fire Tests for Door Assemblies.
- D. Underwriters Laboratories (UL):
  - 1. UL 10B - Fire Tests of Door Assemblies.
  - 2. UL 263 - Fire Tests Of Building Construction And Materials.

## 1.3 QUALITY ASSURANCE

- A. Perform Work in accordance with UL requirements.
- B. Fire-Rated Access Doors and Frames: Provide units complying with NFPA 80 that are identical to assemblies tested for fire-test-response characteristics per the following test method and that are listed and labeled by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
  - 1. NFPA 252 or UL 10B for vertical access doors and frames.
  - 2. ASTM E 119 or UL 263 for horizontal access doors and frames.

## PART 2 - PRODUCTS

## 2.1 MANUFACTURERS

- A. Provide access doors by one of the following manufacturers:
  - 1. Milcor, a duravent Group brand, Kentwood, MI; (800) 624-8642, [milcor@hartcool.com](mailto:milcor@hartcool.com).
  - 2. Acudor Products, Inc., Roseland, NJ; (800) 722-0501, [info@acudor.com](mailto:info@acudor.com).
  - 3. Nystrom Building Products, Minneapolis, MN; (800) 547-2635 or (612) 781-7850, [info@nystrom.com](mailto:info@nystrom.com).

## 2.2 STEEL MATERIALS

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- A. Steel Sheet: Uncoated or electrolytic zinc-coated, ASTM A 879 with cold-rolled steel sheet substrate complying with ASTM A 1008, Commercial Steel (CS), exposed.
- B. Metallic-Coated Steel Sheet: ASTM A 653, Commercial Steel (CS) with A60 zinc-iron-alloy (galvannealed) coating or G60 mill-phosphatized zinc coating.
- C. Drywall Beads: 0.0299-inch zinc-coated steel sheet to receive joint compound.
- D. Manufacturer's standard finish factory primed finish.

### 2.3 ACCESS DOORS AND FRAMES FOR WALLS AND CEILINGS

- A. Flush Access Doors and Frames:
  - 1. Fabricated from steel sheet
  - 2. Exposed Trim Type:
    - a. Model NT by Nystrom.
    - b. Model M 3202 by Milcor.
    - c. Model UF 5000 by Acudor.
  - 3. Trimless Frame:
    - a. Model MW by Nystrom.
    - b. Model DW 3203 by Milcor.
    - c. Model DW 5040 by Acudor.
  - 4. Locations: Wall and ceiling.
  - 5. Door: Minimum 0.060-inch- thick sheet metal.
  - 6. Frame: Minimum 0.060-inch- thick sheet metal with 1-1/4-inch- wide, surface-mounted trim.
  - 7. Hinges: Spring-loaded, concealed-pin type or continuous piano.
  - 8. Latch: Cam latch with interior release. Provide latch for all units unless specified to have locks.
  - 9. Lock: Cylinder with 2 keys. Provide lockable cylinders as follows:
    - a. Exterior locations.
  - 10. Units larger than 24 inches on the hinge side shall have two locks or latches.
- B. Fire-rated, Insulated, Flush Access Doors and Frames:
  - 1. Fabricated from steel sheet
  - 2. Exposed Trim or Trimless Type:
    - a. Model IT or IW by Nystrom
    - b. Model UFR 3218 by Milcor.
    - c. Model FW 5050 by Acudor.
  - 3. Locations: Wall and ceiling surfaces.
  - 4. Fire-Resistance Rating: Not less than that of adjacent construction.
  - 5. Temperature Rise Rating: 250 deg F at the end of 30 minutes.
  - 6. Door: Flush panel with a core of mineral-fiber insulation enclosed in sheet metal with a minimum thickness of 0.036 inch.
  - 7. Frame: Minimum 0.060-inch- thick sheet metal with 1-inch- wide, surface-mounted trim.
  - 8. Hinges: Concealed-pin type or continuous piano.
  - 9. Automatic Closer: Spring type.
  - 10. Latch: Self-latching device operated with interior release.
  - 11. Size: Minimum 24 x 36 inches except where otherwise shown on the drawings.
- C. Trash Chute Door: Coordinate size of trash chute access door with trash compactor vendor.
- D. Substitutions: Not Permitted.

### 2.4 FINISH

- A. Base Metal Protection: Factory prime coat units with electrostatic baked on electrostatic powder. For ceiling units, prime exposed edges with coat of white rust-inhibitive paint.

## PART 3 - EXECUTION

### 3.1 INSPECTION

- A. Verify rough openings for door and frame are correctly sized and located.
- B. Beginning of installation means acceptance of existing conditions.

### 3.2 INSTALLATION

- A. Install units in accordance with manufacturer's instructions.
- B. Install units plumb, square and flush with adjacent ceiling or wall surface. Secure rigidly in place.
- C. Position to provide convenient access to concealed work requiring access.
- D. Provide weather tight installation at exterior locations

### 3.3 ACCESS DOOR SCHEDULE

- A. Provide access door and frame suitable for the application.
- B. Install trimless access door and frame in interior gypsum board walls and ceilings and other locations suitable and adaptable for trimless installation
- C. Install exposed trim access door and frame where at exterior locations and where impractical to install trimless installation.
- D. Install access doors in ceilings and walls in locations as shown on the Drawings, at valves, controls, and manual dampers requiring access, and as required by code and governing authorities.
- E. For access doors adjacent to secure areas (Cash/Counting Room), coordinate location with Wal-Mart Construction Manager.

END OF SECTION

## SECTION 08383 - TRAFFIC DOORS

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes: Owner furnished, Contractor installed doors as follows:
  - 1. Full-height traffic doors.
  - 2. Café style traffic doors.
  
- B. Related Requirements: The following list is intended to aid in locating work related to or dependent on the scope of Work in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
  - 1. Section 01600 – Product Requirements: Contractor’s Product Lead Time Schedule.
  - 2. Section 05500 - Metal Fabrications: Prepared opening with steel channel jambs and head.
  - 3. Appendix A – Products and Work by Owner or Separate Contractor: Manufacturers, suppliers, product descriptions, and general procedures related to Owner furnished products.

## 1.2 DELIVERY, STORAGE AND HANDLING

- A. Transport, handle, store, and protect Owner furnished products in compliance with the requirements of Section 01600 and manufacturer’s recommendations.
  
- B. Product Packaging: Owner’s Suppliers will ship doors in manufacturer's standard packaging with identification markings on each component or package.
  
- C. Receive and accept products and report suspected defects and shipping discrepancies in compliance with the requirements of Section 01600.
  
- D. Store doors and accessories in unopened packages in protected dry area to prevent damage from environmental and construction operations.

## PART 2 - PRODUCTS

## 2.1 OWNER FURNISHED PRODUCTS

- A. Owner’s Supplier will furnish products and equipment within the Scope of this Section as specified in Appendix A (Section 08383).
  
- B. Order bulk parts and replacements, if required for project, through one of Owner’s selected original equipment manufacturers as specified in Appendix A (Section 08383).

## PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Verify that openings are ready to receive work and opening dimensions and clearances are as indicated on Drawings.
  
- B. Beginning of installation means acceptance of existing conditions.

## 3.2 INSTALLATION

- A. For piece component and part replacements, request from and install replacement kits as provided by the Owner’s pre-selected supplier specified herein.

- B. Install door unit assembly to manufacturer's installation instructions and manufacturer's location and installation drawings.
- C. Frame Mounted Traffic Doors: Use anchorage devices to fasten flexible traffic door assembly to door frame construction without distortion or imposed stresses.
- D. Fit and align door assembly level and plumb.
- E. Adjust door assembly to provide smooth operation from closed to full open position.

### 3.3 CLEANING

- A. Remove protective material from pre-finished surfaces.
- B. Remove labels and visible markings.
- C. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Wipe surfaces clean.

END OF SECTION



## SECTION 08462 - AUTOMATIC SLIDING ENTRANCE DOORS

## PART 1 - GENERAL

## 1.1 SUMMARY

## A. Section Includes:

1. Owner furnished and installed electric operated automatic sliding entrance doors and control systems, with transom assemblies, including frames, glazing, and hardware.

## B. Related Requirements: The following list is intended to aid in locating work related to or dependent on the scope of Work in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.

1. Section 07900 - Joint Sealers.
2. Section 08411 - Aluminum Framed Storefronts: Aluminum framed storefront system for installation of Automatic entrance doors.
3. Section 08800 - Glazing: Storefront system glass.
4. Section 08845 – Glass Film Finishes: Field-applied adhesive glass film for automatic sliding entrance doors.
5. Section 09777 – Vinyl Graphic Film Wrap: Vinyl “Emergency Exit” glazing decals installed by Contractor.
6. Section 16100 - Wiring Methods: Power to automatic doors.
7. Appendix A – Products and Work By Owner or Separate Contractor: Manufacturers, suppliers, performance, and general procedures related to Owner furnished products.

## 1.2 ADMINISTRATIVE REQUIREMENTS

## A. Pre-Installation Conference:

1. Convene Pre-installation Conference at Site one week prior to commencing Work of this Section. Require attendance of parties directly affecting Work of this Section, including, but not limited to, Owner’s Construction Manager, Contractor Project Field Superintendent, Aluminum Storefront job foreman, Automatic Entrance Door Manufacturer's Technical Representative, electrical subcontractor field supervisory personnel, and any subcontractor, supplier, or installer directly affecting, or affected by Work of this Section.
2. Contact Owner’s Construction Manager two weeks prior to Pre-installation Conference to confirm schedule.
3. Review foreseeable methods and procedures related to automatic entrance door Work, including the following:
  - a. Tour, inspect, and discuss condition of door assembly openings, connections to building structure, electrical requirements, and other preparatory work performed by other trades.
  - b. Review automatic entrance door system requirements including drawings, specifications and other contract documents.
  - c. Review required submittals, both completed and yet to be completed.
  - d. Review and finalize construction schedule related to automatic entrance door Work and verify availability of materials, installer's personnel, equipment and facilities needed to make progress and avoid delays.
  - e. Review required inspections, operational testing, and certifying procedures.
  - f. Review weather and forecasted weather conditions, and procedures for coping with unfavorable conditions.
  - g. Review preparation and installation procedures and coordinating and scheduling required with related work.
4. Record discussions of conference and decisions and agreements (or disagreements) reached, and furnish copy of record to each party attending.

## 1.3 SCHEDULING AND COORDINATING

- A. Coordinate with Owner’s Supplier to confirm rough openings, tolerances, and dimensions required for each new door. Door production shall not begin until existing conditions are confirmed.

## 1.4 DELIVERY, STORAGE AND HANDLING

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- A. Product Delivery: Automatic Entrance Door Supplier will deliver products to Site and install products. Automatic Entrance Door Supplier will contact Contractor after Award of Contract to establish a product delivery and installation date and establish a coordination procedure.
- B. Product Packaging: Automatic Entrance Doors will be delivered in manufacturer's standard packaging with identification markings on each component or package.
- C. Acceptance at Site: Inspect products with Automatic Entrance Door Supplier upon delivery of products to Site.
  - 1. Verify quantity of products furnished and report defects or discrepancies to Owner and Owner's Suppliers as specified in Section 01600.
- D. Handle, store, and protect products in compliance with the requirements of Section 01600 and manufacturer's recommendations.

## PART 2 - PRODUCTS

### 2.1 OWNER FURNISHED PRODUCTS

- A. Owner's automatic entrance door Supplier will furnish automatic entrance doors and operating systems with all components including glass, hardware and accessories as specified in Appendix A (Section 08462).

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine existing conditions with Automatic Entrance Door Supplier prior to start of door installation.

### 3.2 PREPARATION BY CONTRACTOR

- A. Provide door openings to size indicated on Drawings.
- B. Provide door head level and parallel with floor at door opening. Size and configuration shall be as indicated on the Drawings.
- C. Provide door jambs parallel and plumb.
- D. Provide power to location at door required by door manufacturer ready for power connection.

### 3.3 INSTALLATION BY OWNER

- A. Owner's automatic entrance door Supplier will install automatic entrance doors and operating systems with all components including glass, hardware, and accessories as specified in Appendix A (Section 08462).

### 3.4 INSTALLATION BY CONTRACTOR

- A. Make final power connections to automatic entrance doors as specified in Section 16100.
- B. Furnish and install keyed cylinder and thumbturn if and where specified in Section 08710.
- C. Interface with Other Work:
  - 1. Coordinate locations of power connections and requirements.
  - 2. Coordinate locations of building management alarm connections and requirements.
  - 3. Coordinate requirements for door openings required for automatic entrance door installation.

END OF SECTION

## SECTION 08710 - DOOR HARDWARE

## PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes: The following products and equipment installed by Contractor and furnished by either Owner or Contractor as indicated herein:
1. Hardware for doors.
  2. Thresholds.
  3. Weatherstripping, seals, and door gaskets.
- B. Related Requirements: The following list is intended to aid in locating work related to or dependent on the scope of Work in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
1. Section 01600 – Product Requirements: Contractor’s Product Lead Time Schedule.
  2. Section 03310 - Cast-In-Place Structural Concrete: Non-shrink grout for thresholds.
  3. Section 06100 - Rough Carpentry: Blocking for miscellaneous hardware mounting.
  4. Section 06400 - Architectural Woodwork: Hardware for cabinetry and other finish carpentry.
  5. Section 08110 - Steel Doors and Frames: Hardware coordination.
  6. Section 08150 – HDPE Recycled Plastic Man Doors. Hardware coordination.
  7. Section 08331 - Coiling Counter Doors: Hardware coordination.
  8. Section 08411 - Aluminum Framed Storefronts: Hardware coordination.
  9. Section 08462 - Automatic Sliding Entrance Doors: Hardware coordination.
  10. Section 08710 Contractor SCHEDULE – List of Contractor provided hardware sets or groups assigned to each proto door.
  11. Section 08710 Owner Furnished SCHEDULE – List of Owner furnished hardware sets or groups assigned to each proto door.
  12. Section 11025 – Lock Boxes: As required for Pharmacist-controlled master key.
  13. Section 16100 - Wiring Methods: Electrified hardware coordination.
  14. Appendix A – Products and Work By Owner or Separate Contractor: Manufacturers, suppliers, products information, and procedures related to Owner furnished products and work.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. Americans with Disabilities Act (ADA):
1. 28 CFR Part 36 – ADA Standards for Accessible Design.
- C. American National Standards Institute (ANSI):
1. ANSI A117.1 - Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People.
  2. ANSI A 156.2 - Bored and Preamsembled Locks and Latches.
  3. ANSI A 156.6 - Architectural Door Trim.
  4. ANSI A 156.13 - Mortise Locks and Latches.
  5. ANSI A 156.15 - Release Devices – Closer Holder, Electromagnetic and Electromechanical.
- D. National Fire Protection Institute (NFPA):
1. NFPA 80 - Fire Doors and Windows.
  2. NFPA 101 - Code for Safety to Life from Fire in Buildings and Structures.
  3. NFPA 252 - Fire Tests of Door Assemblies.
- E. Underwriters Laboratories (UL):

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1. UL 10B - Fire Tests of Door Assemblies.
2. UL 305 - Panic Hardware.
- 1.

### 1.3 REGULATORY REQUIREMENTS

- B. Perform work in accordance with the following standards:
  1. ANSI A117.1
  2. NFPA 101.
  3. NFPA 80.
  4. NFPA 252.
  5. UL 10B.
  6. UL 305.
- C. Conform to applicable code requirements for fire rated doors and frames.
- D. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories, Inc. (UL), and acceptable to Authority Having Jurisdiction as suitable for the purpose specified and indicated.
- E. Conform to applicable local, State or Federal disabled access requirements for the installation and operation of door hardware.

### 1.4 DELIVERY, STORAGE AND HANDLING

- A. Transport, handle, store, and protect products in compliance with the requirements of Section 01600.
- B. Product Packaging: Hardware will be shipped in manufacturer's standard packaging with identification markings on each component or package.
- C. Receive and accept products and report suspected defects and shipping discrepancies in compliance with the requirements of Section 01600. Inspect delivered products for compliance with product descriptions in Part 2 herein. Report discrepancies to the Architect.
- D. Product Delivery: Owner's Supplier will deliver Owner furnished products to site to be received by Contractor. Contact Owner's Supplier to coordinate product delivery, receipt and installation.
- E. Store products in unopened packages in protected dry area to prevent damage from environmental and construction operations.

## PART 2 PRODUCTS

### 2.1 PRODUCT SCHEDULES

- A. Hardware components assigned to each prototypical door and listed in sets or groups are located in the 08710 SCHEDULES and made a part of this Section by reference.
  1. Information for use of the 08710 SCHEDULES is included in Part 3 herein.

### 2.2 OWNER FURNISHED PRODUCTS

- A. Owner's Suppliers may furnish part of or all hardware components for Owner furnished doors as indicated in the 08710 Owner Furnished Hardware SCHEDULES.

### 2.3 MANUFACTURERS

- A. Provide hardware as manufactured by those listed in the Hardware Manufacturer Designation Schedule in Part 2 herein. Substitutions not permitted.

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- B. Product Designations: Hardware may be any of the products listed within the tables herein for each specific type. Substitutions not permitted.
- 1.

C. Hardware Manufacturer Designations:

ID	Manufacturer	Telephone
Ad	<a href="#">Adams Rite (Assa Abloy)</a>	(800) 872-3267
Ar	Arrow USA Lock and Door Hardware (Assa Abloy)	(800) 839-3157
De	Detex Corporation	(800) 629-2900
GJ	Glynn-Johnson (Allegion)	(877) 671-7011
H	Hager Companies	(800) 325-9995
HES	HES (Assa Abloy)	(623) 582-4626
HID	HID Global (Assa Abloy)	(800) 237-7769
I	H. B. Ives (Allegion)	(877) 671-7011
LCN	LCN Closers (Allegion)	(877) 671-7011
Mc	McKinney (Assa Abloy)	(800) 346-7707
Na	National Guard Products, Inc.	(800) 647-7874
P	Pemko Mfg. Co. (Assa Abloy)	West Coast (800) 283-9988 East Coast (800) 824-3018
Po	Positive Lock	(800) 342-7670
Re	Reese Enterprises, Inc.	(800) 328-0953
Ri	Rixson (Assa Abloy)	(800) 457-5670
Ro	Rockwood (Assa Abloy)	(814) 926-2026
Sc	Schlage (Allegion)	(888) 805-9837
Sec	Assa Abloy Electronic Security Hardware (formerly Securitron)	(800) 626-7590
Sel	Select Hinges	(800) 585-1019
S	Stanley Hardware	(855) 365-2407
T	Trimco (Triangle Brass Mfg.)	(323) 262-4191
VD	Von Duprin (Allegion)	(877) 671-7011

2.4 SUPPLIERS

- A. Door hardware is generally Supplied as part of a door package by either Contractor or Owner according to responsibility for the door itself, those Suppliers as referenced in the 08710 SCHEDULES and defined in the door Specifications Sections.
- B. Piece replacements and individual hardware components as required but not associated with a door package shall be purchased by Contractor from the Supplier of the door itself, those Suppliers as referenced in the 08710 SCHEDULES and defined in the door Specifications Sections.
- C. Positive Lock Exit Devices: As with other hardware components, responsibility for Positive Lock Exit Hardware aligns with responsibility for the door itself. However, supply of Positive Lock hardware to either Contractor or Owner is facilitated exclusively by Positive Lock as the manufacturer and Sole Supplier of Positive Lock components, and is not defined in any other Specification Section.
  1. Contact Kimbra Wolfe, (479) 967-6232, [kimbra.wolfe@positivelock.com](mailto:kimbra.wolfe@positivelock.com).

2.5 FINISHES

- A. Provide finishes as specified in Part 2 of this Section unless otherwise indicated in the 08710 Hardware SCHEDULES for the specific hardware item.

2.6 HINGES

A. Material:

1. Mortise Butts: Provide full mortise-type hinges with stainless steel pins, except steel pins with steel hinges; non-removable pin (NRP) for exterior and public interior exposure, non-rising pin, flat button with matching plugs, 4-1/2 inches x 4-1/2 inches unless otherwise shown.
2. Ball-bearing Type Hinges: Swaged, inner leaf beveled, square corners.
3. Full-surface Reinforcing Pivot:
  - a. For 4-1/2 inch butts with standard 1/4-inch backset.
  - b. Install per manufacturer's written instructions using attachments furnished with pivot.
4. Continuous Geared Hinge: Full surface type hinge of 6063 T6 Aluminum with thermoplastic polyester bearings, 90 min. fire rated, clear finish. Provide self drilling threaded fasteners for frame and thru bolts for door.

B. Hinges by Types:

Type	Description	Finish	MANUFACTURER/MODEL		
			Stanley	Hager	McKinney
H-2	Butts: Medium weight door, low frequency, steel	652	F179	1279	T2714
H-4	Butts: Medium weight door, average frequency, steel	652	FBB179	BB1279	TB2714
			Select Hinge	Hager	
H-7	Hinge: Continuous geared hinge	CL	SL21 SD x SDTF x FDH	Roton 780-210	
			Stanley	Hager	McKinney
H-8	Hinge: Surface mounted 3 x 3	US2H	808BP	1808	705
H-9	Butts: Heavy weight, stainless steel	630	FBB199	BB1199	T4B3386
H-11	Butts: Medium weight, stainless steel	630	FBB191	BB1191	TB3386
H-15	Pivot: Full-Surface Reinforcing (Helper Hinge)			253 (right or left handed as applicable)	

2.7 REMODEL PROJECTS: LOCKS, LATCHES, AND BOLTS

A. Materials:

1. Cylindrical Locks: ANSI A156.2, Series 4000 Grade 1, equipped with 6-pin tumbler; "keyed alike" to match keying system of existing locks to remain if compatible. Provide 2-3/4 inch backset. Provide two keys for each lock.
2. Mortise Locks: ANSI A156.13, Grade 1, equipped with 6-pin tumbler; "keyed alike" to match keying system of existing locks to remain. Provide 2-3/4 inch backset. Provide two keys for each lock.
3. Provide Schlage standard C123 keyway (except at Pharmacy).
4. Provide Schlage Primus XP cylinders for Pharmacy 300 series locks.
5. Master key, key alike or different as directed.
6. Quantity: In addition to two keys for each lock, provide the following:
  - a. Cylinder Change Keys: 6 change keys per change
  - b. Master Keys: 10.
7. Latch Sets: Provide push-button releases by turning lever, closing door, or turning emergency release key through hole in outside lever.
8. Strikes: ANSI Strikes, 1-1/4 inches x 4-7/8 inches, with curved lip. Wrought box strikes, with extended lip for latch bolts, except open strike plates may be used in wood frames. Provide dustproof strikes for foot bolts.
9. Tactile Warning: Provide locks with tactile warning for handicapped codes when required by local jurisdiction having authority.

B. Locks by types:

Type	Description	Finish	MANUFACTURER/MODEL
			Schlage
L-1	Mortise Cylinder	626	20-001
L-2	Mortise Cylinder	626	20-001-1-1/4 inches

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L-3	Rim Cylinder	626	20-022
L-4	Classroom Lock	626	ND70PD Rhodes
L-5	Storeroom Lock (F86)	626	ND80PD-Rhodes- 25
L-6	Office Lock (F82)	626	ND50PD-Rhodes-10-025
L-7	Passage Latch (F75)	626	ND10S - Rhodes- 10-025
L-8	Privacy Lock (F76)	626	ND40S - Rhodes- 10-025
L-9	Dead Bolt Lock	626	B661P
L-9a	Dead Bolt Lock	626	B660BD SFIC Deadlock Less Core w/ 12-617 thumbturn
L-10	Access Control Lock	626	CO-100-CY-70-KP-RHO-626PD
L-11	Entrance Lock (F81/82)	626	ND53PD– Rhodes 10– 25
L-12	Storeroom Lock with deadbolt	626	L9480-06L
L-13	Institutional Lock (F87)	626	ND82PD-Rhodes 10- 025
L-15	Entrance Lock with deadbolt	626	L9453-06L
L-16	Dead Bolt Lock with Thumbturn (Classroom Function)	626	B663P
L-17	Storeroom Lock (Grade 2)	626	AL80PD-Saturn
L-18	Privacy Lock (Grade 2)	626	AL40S-Saturn
L-20	Office Lock (Grade 2)	626	AL50PD-Saturn
L-21	Passage Lock (Grade 2)	626	AL10S-Saturn
L-22	Thumbturn Cylinder	626	09-905NHxB502-292
L-23	Construction Core	Green	Brass Construction Core, 7 Pin.
L-23a	Dead Bolt Lock w/ Conventional Core	626	B660P
L-24	Entrance/Office Lock (F82)	626	ND91PD-Rhodes 10-025
L-25	Mortise Privacy Lock with Indicator	626	L9496P 06L
			Adams Rite
L-26	Dead Bolt Lock	626	MS1850SN-45X
			Schlage
L-27	Mortise Cylinder	626	80-110 SFIC Lock Less Core
L-28	Rim Cylinder	626	80-116 SFIC Lock Less Core
			Adams Rite
L-29	Mortise Cylinder	626	4510
L-30	Placeheld for WM Fuel Program	-	-
			Schlage
L-31	Rim Thumbturn (used exclusively with E-30 exit device)	626	XB13-379

2.8 EXIT DEVICES

A. Materials:

1. Provide exposed metal to match hardware.
2. Size and mount units indicated or, if not indicated, to comply with manufacturer's recommendations for exposure condition. Reinforce substrate as recommended.

B. Exit Devices by types:

Type	Description	Finish	MANUFACTURER/MODEL
			Von Duprin, unless otherwise noted.
E-1	Exit Device: Rim, exit only, UL listed.	626	99EO-F
E-2	Exit Device: Rim, exit only, with alarm. Provide exterior access model or time delay, or weatherproof when scheduled.	600	Positive Lock: THPA Series (Size as required for door scheduled) O/A – Outside Access TDL – Time Delay WE - Weatherproof

E-3	Exit Device: Surface vertical rod (top rod only), lever trim, blank escutcheon, UL listed.	626	9927L-F-BE-LBR
E-4	Exit Device: Concealed vertical rod, lever trim, blank escutcheon, UL listed	626	9948L-F-BE
E-5	Exit Device: Rim, lever trim, blank escutcheon, UL listed.	626	99L-F-BE
E-7	Exit Device: Rim, pull trim.	626	99NL x 697NL
E-8	Exit Device: Mortise delay exit device, pull trim, with alarm. Power Transfer #EPT-10 Power Supply #PS 914	626 SP28	CX9975L x 992L (06 Lever)
E-10	Exit Device: Rim, exit only	626	99EO
E-11	Exit Device: Rim, weatherproof, exit only, with alarm.	626	Detex: V40 EB W AL RWE
E-14	Exit Device: Vertical Mount, exit only, with alarm. Provide exterior access model or time delay when scheduled.	600	Positive Lock: THPA Series O/A – Outside Access TDL – Time Delay
E-16	Exit Device: Rim, lever trim,	626	99L-992L-NL
E-18	Exit Device: Rim, lever trim, UL Listed	626	99L-F-992L-NL
E-19	Exit Device: Surface vertical rod, no outside trim, exit only, UL listed.	626	9927EO-F
E-20	Exit Device: Rim, lever trim, blank escutcheon	626	99L-BE
E-21	Exit Device	626	99EO
E-23	Exit Device: Rim, lever trim, with alarm Power Transfer #EPT-10 Power Supply #PS-914	626 SP28	CX99NL-F x 696-NL
E-24	Exit Device: Rim, lever trim, with alarm Power Transfer #EPT-10 Power Supply #PS-914	626 SP28	CX99EO-F
E-25	Exit Device Paddle	600	Positive Lock 24" Exit Device Paddle
E-26	Exit Device: Rim, lever trim, blank escutcheon, with alarm	626	LX-99-L-BE-ALK
E-27	Exit Device: Rim, standard lever trim, with alarm	628	RX-33A-L-ALK
E-28	Exit Device: Rim, lever trim, blank escutcheon, with alarm	628	LX-33A-L-BE-ALK
			Adams Rite
E-29	Dead Latch + Handle	628	4510+4569
			Von Duprin
E-30	Exit Device: Rim, lever trim (used exclusively with L-31 thumbturn)	626	99-2x996-2LBE (06 Lever)

## 2.9 PULLS AND PUSHES

A. Materials: ANSI A156.6 for 0.050 inch thickness.

B. Push and Pulls by Types:

Type	Description	Finish	MANUFACTURER/MODEL		
			Ives	Trimco	Rockwood
P-1	Push 3-1/2 inches x 15 inches	630	8200	1001-2	70B
P-2	Pull 3-1/2 inches x 15 inches	630	8311-5	1012-2	137x70B
P-3	Pull 8 inches CTC x 3/4 inch dia	626	8103-8	1194-2	107
P-4	Pull 5-1/4 cc	630	8111-5	1102T	132
P-6	Pull 3 inches (Pocket Door)				102

## 2.10 CLOSERS

A. Materials & Features:

1. ANSI A156.4, grade 1.
2. ADA/ANSI A117.1

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3. UL listed.
4. Non-handed, non-sized; adjustable 1-6.
5. 180 degree door opening.
6. Standard cover.
7. Multiple backcheck location valve.
8. Extreme temperature fluid.
9. Sex nuts and bolts (SNBs).
10. Provide exposed metal to match hardware.
11. Size and mount units indicated or, if not indicated, to comply with manufacturer's recommendations for exposure condition. Reinforce substrate as recommended.

B. Closers by types:

Type	Description	Finish	MANUFACTURER/MODEL
			LCN
C-4	Closer: Regular Arm	689	4011-REG
C-5	Closer: Parallel Arm	689	4111-EDA
C-6	Closer: Regular Arm	689	4031-REG
C-7	Closer: Parallel Arm	689	4031-EDA
C-8	Closer: Parallel Arm, HO	689	4111-HEDA
C-9	Closer: Parallel Arm, HO, positive stop	689	4111-H-CUSH
C-10	Closer: Regular Arm, HO	689	4031-H
C-11	Closer: Parallel Arm, positive stop	689	4031-CUSH
C-12	Closer: Parallel Arm, Positive Stop	689	4111-CUSH

2.11 DOOR PROTECTION PLATES

- A. Materials: J100 Protection Plates conforming to ANSI 156.6, stainless steel, 0.050 inch (1.2 mm) minimum thickness. Mount centered, flush with bottom of door. Screws: Phillips head sheet metal screws plated to match plate.
- B. Protection plates, including kick plates and armor plates, are not used for HDPE recycled plastic man doors.

C. Protection Plates by types:

Type	Description	Size	Finish	MANUFACTURER/MODEL		
				Ives	Trimco	Rockwood
K-2	Kick Plate	10 inch x (DW-2 inch)	630	8400	K1050	J102
K-3	Armor Plate	34 inch x (DW-2 inch)	630	8400	K1050	J101
K-4	Armor Plate	41 inch x (DW-2 inch) Notch for lockset	630	8400	K1050	J101
K-5	Kick Plate	18 inch x (DW-2 inch)	630	8400	K1050	J102
K-6	Armor Plate (UL Rated)	34 inch x (DW-2 inch)	630	8402UL	KA050-2 Fire Rated	K1050F
K-7	Armor Plate (UL Rated)	36 inch x (DW-2 inch)	630	8402UL	KA050-2 Fire Rated	K1050F

2.12 STOPS, HOLDERS AND BUMPERS

- A. Materials:
  1. Door stop mounting: Methods to suit substrates encountered (plastic anchor, drywall anchor, expansion shield).
  2. Provide gray rubber exposed resilient parts.
  3. Do not furnish aluminum floor stops.
  4. For most doors, the preferred door stop is Wall Stop type S-1 and is specified as such in the hardware schedule. However, if circumstances prevent a wall stop installation (door too far from perpendicular wall, door swing into adjacent glass, etc.) then substitute a type S-3 or S-4 floor stop as indicated for use intended.
  5. Adjust height of floor stops to suit undercut of adjacent door.

B. Stops, Holders and Bumpers by types:

Type	Description	Finish	MANUFACTURER/MODEL		
			Ives	Trimco	Rockwood
S-1	Wall Stop	630	WS407CVX	W1276CS	409
S-2	Stop & Holder	626	WS445	1207	477
S-3	Projected Wall Stop	626	WS443	1205	474
S-4	Floor Stop	626	FS438	1212 3/4ES	442
			Rixson	Glynn-Johnson	
S-5	Overhead Stop - 3-0 doors	626	9-336	904S	
S-6	Overhead Stop - 2-6 doors	626	9-236	902S	
			Ives	Trimco	Rockwood
S-7	Stop & Holder. Kickdown type. Alum or satin chrome		FS452-4	1221-4FF	458
			Rixson	Glynn-Johnson	
S-8	Overhead Stop. Medium duty	630	10-336	454S	
			Pemko		
S-9	Auxiliary Track Stop (Pocket Door)		287R-1-KIT		

2.13 ELECTROMAGNETIC DOOR HOLDERS

A. Materials & Features:

1. ANSI A156.15, Grade 1.
2. UL listed.
3. Magnet protected against transients and surges up to 600 volts.
4. 24V DC
5. Holding force 35 lbs., nominal.
6. Low residual magnetism for easy release of door.
7. Electrical values +10% -15%.
8. Provide exposed metal to match hardware.

B. Electromagnetic Door Holders by types:

Type	Description	Finish	MANUFACTURER/MODEL		
			LCN	Rixon	
DH-1	Door Holder	As Scheduled	SEM 7850 689	FM-998 SA	

2.14 THRESHOLDS

A. Thresholds by types:

Type	Description	MANUFACTURER/MODEL		
		National Guard	Pemko	Reese
T-1	Threshold: 5 inches x 1/2 inch, abrasive.	425HD-SIA 5"	1715AK 5"	
T-4	Threshold: 2 inches x 1/8 inch, stainless steel plate, smooth surface, beveled 1 side only. Transition threshold between concrete slab and vinyl tile. Set threshold in full bed of silicone sealant, butted to adjacent vinyl tile. Anchor into concrete slab with Hilti Kwik-Con II, #14-134 TFH fasteners spaced at 6-inch centers using Matched Tolerance drill bit for dense concrete.	BAR6SS-2-10 bevel		
T-9	Threshold: 5 inches, aluminum, stop seal	896V	2005AT	S483AV
T-10	Threshold: 5 inches, aluminum, stop seal	898V	2006AT	
T-11	Threshold: 12 inches x 1/4" tall with 1/2" offset. Interlocking Ramp Threshold.	RO50		

2.15 WEATHERSTRIPPING

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A. Weatherstripping by types:

Type	Description	MANUFACTURER/MODEL		
		National Guard	Pemko	Reese
W-1	Jamb & Head Weatherstripping, aluminum, vinyl insert, screw-on type	155V	303AV	807A
W-3	Door Bottom Sweep, surface mounted sweep, anodized aluminum, neoprene seal.	201NA	315CN	323A
W-4	Meeting Stile Gaskets, aluminum, silicone insert seal.	160S	303AS	807A
W-5	Jamb Door Gaskets, adhesive application, silicone seal.	5050B	S88D	797B
W-6	Door Shoe Weatherstripping, for hollow metal doors with inverted bottom channel, recessed thermo-plastic insert, slotted/adjustable.	35EN	222PK	596AF

2.16 MISCELLANEOUS HARDWARE

A. Silencers: Provide in metal door frames, unless not permitted for fire rating, or unless bumper-type weatherstripping is provided; three for each single door frame, two for double-door frame.

B. Miscellaneous Hardware by types:

Type	Description	Size	Finish	MANUFACTURER/MODEL		
				Stanley	Ives	Rockwood
M-1	Hasp & Staple	3-1/2 inches	602	SP915	WS1920	
M-2	Surface Bolt	8 inches	652		SB453	
M-3	Surface Bolt	4 inches	626		40	630
M-4	Viewer		626		700	620
				Ives	Trimco	Rockwood
M-5	Extension Flush Bolts (UL)	12 inches	626	458	3917	555
M-6	Automatic Flush Bolt		626	FB42		1948
				Ives	Trimco	Rockwood
M-8	Silencers			SR64	1229-A	608
				National Guard	Pemko	Reese
M-9	Drip Cap			16A	346CxFW	R201A
				Ives	Trimco	
M-10	Door Coordinator			CORxMBxFL	3092xMBxW	
				Arrow	Detex	
M-11	Door Alarm with mortise cylinder		626	130 Series AL	EAX-500	
M-12	Door Alarm with rim cylinder		Gray		Alarm: EAX-2500F Transformer: PP5152-3	
				Rockwood		
M-15	Latch Protector		630	321		
				Von Duprin	Schlage	Securitron
M-16	Electric Strike, grade 1, FSE (fail secure), 24 VDC unless noted otherwise in schedule		630	6211		
M-17	Power Supply			PS902		
M-18	Push Button				660PB	
M-20	Power Supply					BPS-24-1
M-21	Keypad & Controller					DK-26SS
M-21a	Keypad					DK-26PSS
				Von Duprin		
M-24	Mullion		626	9954		
M-25	Strike		626	499F		
				HES		
M-26	Electric Strike, grade 1, FSE (fail secure), 24 VDC unless noted otherwise in schedule		630	9600 C		
M-19	Electric Strike		630	1006 CS 12/24D		

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			Pemko
M-27	Pocket Frame Cavity Conversion kit.		PF134KIT
M-28	Hangers for 175 lbs, bumper stop, guide, header shims, and floor cleats (as kit) for 1-3/4 inch door		PFKIT-4
			HID Global
M-29	Keypad		EntryProx plus 20 ProxCard II 4045CGCU0
			Schlage
M-30	Push-to-Exit Button (1-5/8 Red Mushroom); with Heavy Duty Clear Polycarbonate Protective Lift Cover	630	623-RD-EX-DA; Model as supplied by Exit Button Supplier
M-31	Electronic Audible Warning Device	Off-white	1910-1: 12/24 VDC Horn

## 2.17 FABRICATION

- A. Finish and Base Material Designations: Number indicates Builders Hardware Manufacturer's Association (BHMA) Code or nearest traditional U.S. commercial finish.
- B. Where base material and quality of finish are not otherwise indicated, provide at least commercially recognized quality.
- C. Fasteners: Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.
  1. Fire-Rated Applications:
    - a. Wood or Machine Screws: For the following:
      - 1) Hinges mortised to doors or frames.
      - 2) Strike plates to frames.
      - 3) Closers to doors and frames.
    - b. Steel Through Bolts: For the following unless door blocking is provided:
      - 1) Surface hinges to doors.
      - 2) Closers to doors and frames.
      - 3) Surface-mounted exit devices.
  2. Spacers or Sex Bolts: For through bolting of hollow-metal doors.
  3. Gasketing Fasteners: Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify that doors and frames are ready to receive Work and dimensions are as instructed by the manufacturer.
- B. Verify that electric power is available to power operated devices and of the correct characteristics.

### 3.2 INSTALLATION

- A. Hardware Mounting Heights: Door and Hardware Institute Recommended Locations for Builders Hardware for Standard Steel Doors and Frames, except as otherwise indicated.
  1. Conform to requirements of applicable local, State or Federal disabled access requirements for the installation and operation of door hardware.
  2. Install electromagnetic door holder at 24 inches above finish floor elevation at manufacturer's recommended distance from the door's leading edge.
- B. Install each hardware item to comply with manufacturer's instructions and recommendations, unless otherwise specified.

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- C. Thru-bolt closers on doors.
- D. Vestibule Thresholds: Install as shown on Drawings.

### 3.3 ADJUSTING

- A. Hardware Adjustment: Adjust hardware for proper operation and function at construction completion. Instruct Wal-Mart personnel in proper maintenance and adjustment.

### 3.4 HARDWARE SCHEDULES

- A. Numeric and alphabetical designations for Hardware Sets in 08710 SCHEDULES correspond to the numeric/alphabetical door assignments in the Door Schedule shown on the drawings.
- B. The 08710 SCHEDULES represent the full set of hardware as prototypically determined for each door listed. For actual hardware components required for each door in project, refer to the Door Schedule and Schedule Notes as shown on the Drawings.
- C. Contractor's or Owner's Suppliers may provide any part number or brand approved and listed in the Tables in Part 2 herein for each alpha-numeric designated type (H-1, E-2, etc).
- D. For interior hollow metal or HDPE recycled plastic man doors and exterior building hollow metal doors which have a tactile exit sign installed on the door, install a door closer (C-5) if a closer does not exist on the door.

END OF SECTION

PART 1 GENERAL

1.1 HARDWARE SCHEDULES

- A. This Schedule is used for Contractor provided door hardware packages, including Contractor provided individual hardware components or work supplemental to Owner furnished door packages. Hardware furnished by Owner's Suppliers, vendors, or separate contractors is located in 08710 Owner Hardware Schedule.
- B. Numeric and alphabetical designations for Hardware Sets in this Schedule correspond to the numeric/alphabetical door assignments in the Door Schedule shown on the drawings.
- C. This Schedule represents the full set of hardware as prototypically determined for each door listed. For actual hardware components required for each door in project, refer to the Door Schedule and Schedule Notes as shown on the Drawings.
- D. Contractor's Suppliers may provide any part number or brand approved and listed in Part 2 of Section 08710 (Base) for each designated type (H-1, E-2, etc).
- E. For interior hollow metal and exterior building hollow metal doors which have a tactile exit sign installed on the door, install a door closer (C-5) if a closer does not exist on the door.

**AUTOMOTIVE CENTER**

**Door 604A - Customer Service: HDPE Recycled Plastic, Single**

1 ea. M-18 Push Button (Locate at Service Desk)

1 ea. M-30 Push-to-Exit Button

1 ea. M-31 Electronic Audible Warning Device

All other door hardware is furnished by Owner and specified in Section 08710 – Owner Hardware Schedule.

END OF SCHEDULE

PART 1 GENERAL

1.1 HARDWARE SCHEDULES

- A. Hardware in this Schedule is furnished by Owner's Suppliers, vendors, or separate contractors, and considered information only to Contractor. If Contractor is required to provide individual hardware components or work supplemental to an Owner furnished door package, hardware components by Contractor are located in 08710 Contractor Hardware SCHEDULE.
- B. Numeric and alphabetical designations for Hardware Sets in this Schedule correspond to the numeric/alphabetical door assignments in the Door Schedule shown on the drawings.
- C. This Schedule represents the full set of hardware as prototypically determined for each door listed. For actual hardware components required for each door in project, refer to the Door Schedule and Schedule Notes as shown on the Drawings.
- D. Owner's Suppliers may provide any part number or brand approved and listed in Part 2 of Section 08710 (Base) for each designated type (H-1, E-2, etc).
- E. For HDPE recycled plastic man doors which have a tactile exit sign installed on the door, install a door closer (C-5) if a closer does not exist on the door.

**Door 106A - Returns Storage: HM, Single, Exterior w/ Exit Device**

- 1 ea. (H-7) Continuous Geared Hinge
- 1 ea. (E-2) Alarm Exit Device
- 1 ea. (T-9) Threshold
- 1 ea. (W-3) Door Bottom Weatherstrip
- 1 set (W-1) Jamb & Head Weatherstrip
- 1 ea. (M-9) Drip Cap

**Door 151E – Breakroom to Sales: HDPE Recycled Plastic, Single, Interior w/ Exit Device**

- 1 ea. (H-7) Continuous Geared Hinge
- 1 ea. (E-2) Exit Device
- 3 ea. (M-8) Silencers

**Door 173A - Personnel: HDPE Recycled Plastic, Single**

- 1 ea. (H-7) Continuous Geared Hinge
- 1 ea. (L-17) Storeroom Lock
- 1 ea. (S-1) Wall Stop
- 3 ea. (M-8) Silencers

**Door 184A – Mother's Room: HDPE Recycled Plastic, Interior, Single**

- 1 ea. H-7 Continuous Geared Hinge
- 1 ea. L-25 Mortise Privacy Lock with Indicator
- 1 ea. C-4 Closer
- 1 ea. S-7 Stop and Holder
- 1 ea. S-1 Wall Stop
- 3 ea. M-8 Silencers

Hardware furnished by Owner and supplied by door manufacturer with door package.

**Door 300G – Pharmacy: (HDPE Recycled Plastic, Single)**

- 1 ea. (H-7) Continuous Geared Hinge
- 1 ea. (L-12) Storeroom Lock with Deadbolt

- 1 ea. (C-5) Closer
- 3 ea. (M-8) Silencers

**Door 303B – Health Service: (HDPE Recycled Plastic, Single)**

- 1 ea. (H-7) Continuous Geared Hinge
- 1 ea. (L-12) Storeroom Lock with Deadbolt
- 1 ea. (C-5) Closer
- 1 ea. (S-4) Floor Stop
- 1 ea. (S-7) Stop/Holder
- 1 set (W-5) Door Gaskets

Carpet transition is furnished by Owner with carpet package and specified in Appendix A (Section 09680).

**Door 303C – Health Service: (HDPE Recycled Plastic, Single)**

- 1 ea. (H-7) Continuous Geared Hinge
- 1 ea. (L-12) Storeroom Lock with Deadbolt
- 1 ea. (C-4) Closer
- 1 set (W-5) Door Gaskets

Carpet transition is furnished by Owner with carpet package and specified in Appendix A (Section 09680).

**Door 604A - Customer Service: HDPE Recycled Plastic, Single**

- 1 ea. (M-30) Push-to-Exit Button
- 1 ea. (M-31) Electronic Audible Warning Device

Customer Service push button door release associated with this door is by Contractor as specified in Section 08710-Contractor Hardware Schedule.

**Door 700A - Optical Sales: Side Folding Grille, Bi-Parting**

Hardware supplied by Side Folding Grille manufacturer as specified in Section 08305.

**Door 711A - Vestibule: Aluminum/Glass, Single, Exterior, Single Acting Outswing**

- 1 ea. (L-27) Mortise Cylinder
- 1 ea. (L-28) Rim Cylinder
- 1 ea. (E-27) Exit Device
- 1 ea. (L-23) Construction Core
- 1 ea. Closer See Section 08411.
- 1 set Continuous Hinge See Section 08411.
- 1 ea. (T-9) Threshold
- 1 ea. (M-9) Drip Cap

Provide exit device and locks with core as listed for retrofit. All other components in this set are shown for information only.

**Door 711C - Vestibule: Aluminum/Glass, Single, Interior, Single Acting Inswing**

- 1 ea. (L-29) Mortise Cylinder
- 1 ea. (E-29) Exit Device
- 1 ea. (L-23) Construction Core
- 1 ea. (M-11) Door alarm
- 1 ea. Closer See Section 08411.
- 1 set Continuous Hinge See Section 08411.

All other hardware supplied by door manufacturer with door package per Sections 08411.

**Door 808A – Board Up Tenant Space: HDPE Recycled Plastic, Interior, Pair**

- 3 pr. (H-2) Butts
- 1 ea. (L-17) Storeroom Lock
- 1 ea. (S-1) Wall Stop
- 1 set (M-5) Extension Flush Bolts (UL)
- 2 ea. (M-8) Silencers



**Door 808B – Board Up Tenant Space: HM, Single, Exterior w/ Exit Device**

- 1 ea. (H-7) Continuous Geared Hinge
- 1 ea. (E-2) Alarm Exit Device
- 1 ea. (T-9) Threshold
- 1 ea. (W-3) Door Bottom Weatherstrip
- 1 set (W-1) Jamb & Head Weatherstrip
- 1 ea. (M-9) Drip Cap

**Door 946A - Pickup Storage: (Aluminum, Automatic w/Breakaway)**

- 1 ea. (L-1) Keyed Cylinder
- 1 ea. Locking Device See Appendix A (Section 08462).

All other Hardware furnished by Owner and supplied by door manufacturer with door package per Appendix A (Section 08462).

**Door 946B – Pickup Storage: (Full Height Traffic, Pair)**

- 1 ea. (T-4) Threshold

All other Hardware supplied by door manufacturer with door package per Section 08383

**Door 995A - Hallway: HM, (2) Singles, Exterior, w/ Exit Device**

- 3 pr. (H-11) Butts
- 2 ea. (E-2) Alarm Exit Device
- 2 ea. (T-9) Threshold
- 2 ea. (W-3) Door Bottom Weatherstrip
- 2 set (W-1) Jamb & Head Weatherstrip
- 1 ea. (M-9) Drip Cap

END OF SCHEDULE

## SECTION 08800 - GLAZING

## PART 1 GENERAL

## 1.1 SUMMARY

## A. Section Includes:

1. Glass and glazing for interior and exterior metal frames and doors, including hollow metal and automatic sliding doors.
2. Glass and glazing for interior recycled plastic doors (HDPE).
3. Glass and glazing for standard storefront and manual swing storefront entrance doors.
4. Glass and glazing for Pharmacy privacy walls furnished by Owner.
5. Pharmacy / Health Services Interior Door glazing furnished and installed by Owner
6. Window Hardware: Sliding glass track assembly.

## B. Related Requirements: The following list is intended to aid in locating work related to or dependent on the scope of Work in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.

1. Section 08110 - Steel Doors and Frames: Glazed doors and fixed window frames.
2. Section 08150 – Recycled Plastic Interior Man Doors
3. Section 08462 - Automatic Sliding Entrance Doors: Glazed doors.
4. Section 08710 - Door Hardware: Hardware coordination.
5. Section 08845 – Glass Film Finishes: Field-applied adhesive glass film.
6. Appendix A – Products and Work By Owner or Separate Contractor: Manufacturers, suppliers, performance, and general procedures related to Owner furnished products.

## 1.2 REFERENCES

## A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the test by these basic designations only.

## B. American National Standards Institute (ANSI):

1. ANSI Z97.1 - Safety Performance Specifications and Methods of Test for Safety Glazing Material Used in Buildings.

## C. ASTM International (ASTM):

1. ASTM C920 - Specification for Elastomeric Joint Sealants.
2. ASTM C1036 - Flat Glass.
3. ASTM C1048 - Heat-Treated Flat Glass - Kind HS, Kind FT Coated and Uncoated Glass.
4. ASTM D2000 - Classification System for Rubber Products in Automotive Applications.
5. ASTM E 1886 - Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials.
6. ASTM E 1996 - Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes.
7. ASTM E2074 - Standard Test Method for Fire Tests of Door Assemblies, Including Positive Pressure Testing of Side-Hinged and Pivoted Swinging Door Assemblies.

## D. Flat Glass Marketing Association (FGMA):

1. FGMA - Glazing Manual and Glazing Sealing Systems Manual.

## E. National Fire Protection Agency (NFPA):

1. NFPA 252: Standard Methods of Fire Tests of Door Assemblies.
2. NFPA 257: Standard on Fire Test for Window and Glass Block Assemblies.

## F. Consumer Product Safety Standards for Architectural Glazing.

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1. CPSC 16 CFR, Part 1201.

G. Underwriters Laboratories, Inc. (UL):

1. UL 10B - Fire Tests of Door Assemblies.

### 1.3 QUALITY ASSURANCE

A. Conform to FGMA Glazing Manual for glazing installation methods.

B. Provide permanent labeling for safety glass indicating conformance with specified standards.

C. Fire-Protection-Rated Glazing Labeling: Permanently mark fire-protection-rated glazing with a UL label of certification or label of certification of a testing agency acceptable to Authorities Having Jurisdiction. Label shall indicate manufacturer's name, test standard, whether glazing is for use in fire doors or other openings, whether or not glazing passes hose-stream test, whether or not glazing has a temperature rise rating of 450 degrees and the fire-resistance rating in minutes.

## PART 2 PRODUCTS

### 2.1 OWNER FURNISHED PRODUCTS

A. Owner's Supplier will furnish and install glazing for interior and exterior automatic sliding doors as part of an Owner furnished automatic sliding door package specified in Section 08462.

B. Owner's Suppliers will furnish and install interior and exterior hollow metal door glazing and interior recycled plastic (HDPE) door glazing as part of the Owner furnished door packages specified in Sections 08110 and 08150, respectively. Door package includes door, frame, door glazing, and door hardware.

C. Owner's Supplier will furnish and install Pharmacy interior hollow metal door glazing as part of the Owner furnished door package specified in Section 08110. Door package includes door, frame, door glazing, and door hardware.

D. Owner's Supplier will furnish glazing for modular Pharmacy privacy walls as part of the Owner furnished modular assembly as specified in Section 13030.

### 2.2 GLASS MATERIALS

A. Tempered Glass: ASTM C 1048, Kind FT (Fully Tempered), Condition A (Uncoated), Type I (Transparent Glass, Flat), Quality q3 (Glazing Select).

1. Conform to ANSI Z97.1 and CPSC 16CFR Part 1201.

2. Tempered glazing panels as specified in the Glass Schedule below (including doors, sidelights, storefronts, and transoms) shall comply with the CPSC 16CFR Part 1201 criteria for Category I or II as follows:

a. Glazing Panels 9 sq. ft. or less: Category I.

b. Glazing Panels more than 9 sq. ft.: Category II.

c. Thickness:

1) Doors and Window Frames: 1/4 inch unless otherwise shown or specified.

2) Pharmacy Privacy Walls: 1/2 inch.

3) 3/8 inch at butt glazing where shown on Drawings.

3. Clear: Class 1 (Clear).

4. Tinted: Class 2 (Tinted Heat Absorbing and Light Reducing).

a. Color: Gray tint or bronze tint (match existing).

B. Acid-etched Glass: Tempered, acid-etched, ASTM C 1048, Kind FT (Fully Tempered), Condition A (Uncoated), Type I (transparent glass, flat), Class 1 (clear), Quality q3 (glazing select). Provide glass with Opaque finish acid-etched one side by Walker Glass Co. Ltd. (888) 320-3030.

1. Unit Thickness: 1 inch thick units; 1/4 inch thick tempered inner and outer panes, with 1/2 inch air space.

2.

- C. Identification:
  - 1. Each unit of tempered glass shall be permanently identified by the manufacturer. The identification shall be etched or ceramic fired on the glass and be visible when the unit is glazed.

## 2.3 GLAZING COMPOUNDS

- A. Polysulphide Sealant: Two component, chemical curing, non-sagging type; cured Shore A hardness of 15-25.
- B. Silicone Sealant: Single component, chemical curing; capable of water immersion without loss of properties; non-bleeding, non-staining; cured Shore A hardness of 15-25.
  - 1. Color: Clear.
- C. Acrylic terpolymer compounded especially for glazing; non-hardening, non-staining, and non-bleeding.

## 2.4 GLAZING ACCESSORIES

- A. Setting Blocks: Resilient blocks of 70 to 90 Shore A durometer hardness; compatible with glazing sealant.
- B. Spacers: Resilient blocks of 40 to 50 Shore A durometer hardness; self adhesive on one side; compatible with glazing sealant.
- C. Filler Rods: Closed cell or jacketed foam rods of polyethylene, butyl, neoprene, polyurethane, or vinyl; compatible with glazing sealant.
- D. Joint Cleaners, Primers, and Sealers: As recommended by glazing sealant manufacturer.
- E. Gaskets: ASTM D2000, SBC 415 to 3BC 620; extruded or molded neoprene or EPDM, black.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify surfaces of glazing channels or recesses are clean, free of obstructions, and ready for work of this Section.
- B. Beginning of installation means acceptance of substrate.

### 3.2 PREPARATION

- A. Clean contact surfaces; prime or seal where recommended by sealant manufacturer for intended application.
- B. Inspect glass edges immediately prior to setting; discard those with edge damage that will contribute to glazing failure.

### 3.3 GLAZING

- A. Locate setting blocks at quarter points of sill; set in sealant if heel or toe bead is required.
- B. Install spacers inside and out except where preshimmed tape or glazing gaskets are to be used.
- C. Set each piece in a series to other pieces in pattern draw, bow, or other visually perceptible characteristics.
- D. Provide glazing sealants and gaskets as required for particular glazing application. Coordinate with other Sections for material compatibility.
- E. Gaskets:
  - 1. Provide adequate anchorage, particularly for driven-in wedge gaskets.

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- 2. Miter and weld ends of channel gaskets at corners to provide continuous gaskets.
  - 3. Seal face gaskets at corners with sealant to close opening and prevent withdrawal of gaskets from corners.
- F. Do not leave voids in glazing channels except as specifically indicated or recommended by glass manufacturer. Force sealant into channel to eliminate voids. Tool exposed surfaces to slight wash away from joint. Trim and clean promptly.
- G. Do not allow sealant to close weeps of aluminum framing.
- H. Provide filler rod where sealants are used in the following locations:
- 1. Head and jamb channels.
  - 2. Colored glass over 75 united inches in size.
  - 3. Clear glass over 125 united inches in size.

3.4 INSTALLATION - BUTT GLAZED METHOD

- A. Apply “H” Trim at butt joints at locations shown on the drawings in accordance with manufacturer’s instructions.

3.5 SLIDING WINDOW TRACK INSTALLATION

- A. Attach sliding window track assembly to hollow metal frame with double faced tape or adhesive as recommended by the manufacturer.

3.6 ADHESIVE GLASS FILM

- A. Field applied glass films are specified in Section 08845.

3.7 ADJUSTING AND CLEANING

- A. Immediately prior to Owner’s acceptance of Project, replace broken or otherwise damaged glass. Wash and polish glass inside and out.

3.8 GLASS SCHEDULE

- A. Provide type of glass specified for the applications scheduled as follows:

APPLICATION/LOCATION	TYPE OF GLASS
Interior Windows	Clear tempered glass unless otherwise shown or specified
Interior Hollow Metal Doors (Section 08110) and Interior Recycled Plastic (HDPE) Doors (Section 08150)	Clear tempered or fire-protection-rated glass as scheduled on the drawings.
Storefront transom (Garden Center Entry) (Section 08411)	Fully etched and sealed tempered glass.
Exterior storefront doors (Section 08411)	Tinted laminated impact-resistant glass.
Locations shown.	Butt Glazed Glass

END OF SECTION

SECTION 08845 – GLASS FILM FINISHES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Field-applied adhesive glass films.
- B. Related Requirements: The following list is intended to aid in locating work related to or dependent on the scope of Work in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
  - 1. Section 08800 – Glazing. Interior and exterior glass and glazing.
  - 2. Appendix A - Products and Work By Owner or Separate Contractor: Manufacturers, suppliers, performance, and general procedures related to Owner furnished products:
    - a. Owner furnished doors and wall components receiving glass film.

1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. ASTM International (ASTM):
  - 1. ASTM F 1642 – Test Method for Glazing and Glazing Systems subject to Airblast Loadings.
- C. American National Standards Institute (ANSI):
  - 1. ANSI Z97.1 – Safety Glazing Materials Used in Buildings.

1.3 SUBMITTALS

- A. Installer Qualifications: Submit documentation showing installer is certified and approved by glass film manufacturer for the type, series, and brand of window film within the scope of this Section.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Applicator shall be an authorized dealer of manufacturer’s film products and shall be trained and certified by the film manufacturer for the type, series, and brand of window film within the scope of this Section.
  - 1. Installers of window film for doors are preselected by Owner as specified herein.

1.5 PROJECT CONDITIONS

- A. Minimum surface and air temperatures shall be 40 degrees F; maximum surface temperature shall be 100 degrees F, or as stated by manufacturer.
- B. Provide continuous ventilation and heating facilities to maintain temperatures above the manufacturer’s stated minimum surface temperature and air temperatures for 24 hours prior to, during, and 48 hours after application of films.

PART 2 - PRODUCTS

2.1 ADHESIVE GLASS FILM SCHEDULE

- A. Decorative, Light Diffusing, or Privacy Films:

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1. Decorative Film on Glass Panels at Refrigerated Cases: Cast, matte, 100% opaque, light transmission blocking. Provide one of the following:
    - a. [Blockout Film](#) Black Matte: 3635-22B by 3M.
    - b. Illusions Decorative Window Film, Specialty Series, Black: NRMM PS2 by [Llumar](#).
  2. Pharmacy Door Decorative Glass Film: Permanent, translucent adhesive glass finish film, applied to exterior side of glass; partial or full film application as shown on Drawings. Provide the following:
    - a. [Fasara Milky Milky San Marino](#) Frost: SH2MAMM by 3M.
- B. Security Films:
1. Door Glass Security Film Supplier/Installer: Procure Security Film products from and coordinate installation for door Security Films with the Owner's preselected Supplier/Installer.
  2. Pickup Automatic Sliding Entrance Door Security and Decorative Glass Films: Clear, micro-layered, tear resistant film, ASTM F 1642. Provide the following:
    - a. Exterior Face of Glass: [Safety Series, Safety and Security Window Films](#), S70X by 3M.
    - b. Interior Face of Glass: [Night Vision Series, Sun Control Window Films](#), NV15 by 3M.
    - c. Provide security film and installation for Pickup Sliding Entrance Door Security Films by Owner's Preselected Supplier/Installer: Clampitt Companies LLC, Springfield MO. Contact Randy Ralph, rralph@clampitt.com, (479) 866-6900 (mobile).
- C. Substitutions of products or designated Supplier/Installer not allowed.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine surfaces and adjacent areas where film will be applied and verify that surfaces conform to product manufacturer's requirements for substrate conditions. Do not proceed until unsatisfactory conditions have been corrected.

#### 3.2 PREPARATION

- A. Apply film only to surfaces free of dirt, grease, moisture, scuffed surfaces and conditions otherwise detrimental to formation of a durable application.
- B. Prepare and clean glass substrate in accordance with film manufacturer's written instructions.
- C. Clean contact surfaces with glass cleaner, removing all streaks, smears, dirt and other debris. If paint appears on the contact surfaces, remove with razor blade and re-clean glass.
- D. Prior to applying film, perform final cleaning of contact surfaces with rubbing alcohol.

#### 3.3 APPLICATION

- A. Apply films in accordance with manufacturer's written instructions and on face side of glass as specified in Part 2 herein. Application may be wet or dry application.
- B. Overlap film vertically and horizontally to reduce stress and damage.

END OF SECTION

## SECTION 09250 - GYPSUM BOARD

## PART 1 - GENERAL

## 1.1 SUMMARY

## A. Section Includes:

1. Interior non load-bearing steel stud partition framing 20 (30 mil) gage and lighter (designed for 5 pounds per square foot uniform load perpendicular to partition).
2. Suspension system for interior gypsum ceilings
3. Gypsum board.
4. Gypsum sheathing.
5. Backer materials: Backer panels for wall tile and plastic wall panels.
6. Textured wallboard coating.

## B. Related Sections: The following list is intended to aid in locating work related to or dependent on the scope of Work in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.

1. Section 01351 – Regulatory Compliance.
2. Section 05400 - Cold Formed Metal Framing: Load-bearing steel stud exterior and interior wall framing 20 gage and heavier and ceiling joists. Cold formed deep leg track for interior nonload-bearing steel stud partitions. Metal stud header wall framing and bracing supported from roof structure.
3. Section 06100 - Rough Carpentry: Wood furring strips, plywood, blocking, and fasteners attached to partition framing.
4. Section 07210 - Building Insulation: Thermal and acoustical insulation.
5. Section 07840 - Firestopping: Installation of firestopping at penetrations of fire-rated partitions.
6. Section 09900 - Paints and Coatings: Paint finish applied to gypsum board.
7. Section 10200 - Vents and Louvers: Soffit Vents.

## 1.2 REFERENCES

## A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the test by these basic designations only.

## B. American Iron and Steel Institute (AISI):

1. AISI S 220: Cold-Formed Steel Framing – Nonstructural Members.

## C. ASTM International (ASTM):

1. ASTM A 653 - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
2. ASTM C 475 - Joint Compound and Joint Tape for Finishing Gypsum Board.
3. ASTM C 557 - Adhesives for Fastening Gypsum Wallboard to Wood Framing.
4. ASTM C 645 - Nonstructural Steel Framing Members.
5. ASTM C 754 - Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
6. ASTM C 840 - Application And Finishing Of Gypsum Board.
7. ASTM C 954 - Steel Drill Screws for the Application of Gypsum Board or Metal Plaster Bases to Steel Studs From 0.033 inches to 0.112 inches in Thickness.
8. ASTM C 1002 - Steel Self-Piercing Tapping Screws For The Application Of Gypsum Panel Products Or Metal Plaster Bases To Wood Studs Or Steel Studs.
9. ASTM C 1177 - Glass Mat Gypsum Substrate for Use as Sheathing.
10. ASTM C 1178 - Coated Glass Mat Water-Resistant Gypsum Backing Panel.
11. ASTM C 1278 – Fiber-Reinforced Gypsum Panel (Backer).
12. ASTM C 1288 – Fiber-Cement Interior Substrate Sheets (Backer).
13. ASTM C 1396 - Gypsum Board.
14. ASTM C 1629 - Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products



and Fiber-Reinforced Cement Panels.

15. ASTM C 1658 - Glass Mat Gypsum Panels.
16. ASTM D 3273 - Standard Test Method for Resistance to Growth of Mold on the Surfaces of Interior Coatings in an Environmental Chamber.
17. ASTM D 3274 - Standard Test Method for Evaluating Degree of Surface Disfigurement of Paint Films by Microbial (Fungal or Algal) Growth or Soil and Dirt Accumulation.

D. Gypsum Association (GA):

1. GA-214 - Levels of Gypsum Board Finish.
2. GA-216 - Application and Finishing of Gypsum Board.
3. GA-234 - Control Joints For Fire-Resistance Rated Systems.
4. GA-600 - Fire Resistance and Sound Control Design Manual.

E. Occupational Safety and Health Administration (OSHA):

1. OSHA 01926.1153 Respirable Crystalline Silica.

F. Steel Stud Manufacturer's Association (SSMA)

1. Member listing

G. Steel Framing Industry Association (SFIA)

1. Member listing

### 1.3 ENVIRONMENTAL REQUIREMENTS

- A. Minimize dust emissions and provide equipment that suppresses dust.
- B. Dispose of construction waste in accordance with the requirements of Section 01351 Regulatory Compliance.

### 1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in the installation of light gage metal framing components and gypsum wallboard with minimum 5 years documented experience.

### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Section 01600 - Product Requirements: Transport, handle, store, and protect products.
- B. Protect metal framing from corrosion, deformation, and other damage during delivery, storage, and handling.
- C. Store and protect metal framing with weatherproof covering, and ventilate to avoid condensation.
- D. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.
- E. Stack gypsum board flat to prevent sagging.

### 1.6 PROJECT CONDITIONS OR SITE CONDITIONS

- A. Environmental Requirements:
  1. Establish and maintain environmental conditions for applying and finishing gypsum board in conformance with GA-216.

## PART 2 - PRODUCTS

### 2.1 GENERAL

- A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction  
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identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency. Products used in the assembly shall carry a classification label from a testing laboratory acceptable to Authority Having Jurisdiction.

2.2 FRAMING MATERIALS

- A. Manufacturer: Subject to compliance with requirements, provide products of one of the following:
  1. [ClarkDietrich](#), West Chester, OH (513) 870-1100.
  2. The Steel Network, Raleigh, NC (888) 474-4876.
  3. Cemco Steel, Ft. Worth, TX (817) 568-1525.
  4. Telling Industries, LLC Willoughby, OH (866) 372-6384.
  5. Marino/WARE, South Plainfield, NJ (800) 627-4661.
  6. Other manufacturers listed as a member of SSMA or SFIA.
- B. Recycled Content of Steel Products: Provide steel framing products with an average recycled content of steel products such that the postconsumer recycled content plus 1/2 of preconsumer recycled content is not less than 25 percent.
- C. Interior Nonload-Bearing Partition Framing: AISI S 220, ASTM C 645 and C 754; galvanized sheet steel, channel shaped, 1 ¼-inch flange width, punched for utility access, depth and gages as indicated below unless otherwise indicated on Drawings.

Stud Depth	Partition Height/Unsupported Length*	Minimum Gage (mil)	Max Stud Spacing (Center-to-Center)
3-5/8 inches	Up to 8'-0"	25 gage (18 mil)	24-inches
3-5/8 inches	Up to 13'-4"	20 gage (30 mil)	24-inches
3-5/8 inches	13'-4" to 16'-3"	20 gage (30 mil)	16-inches
6-inches	Up to 18'-9"	20 gage (30 mil)	24-inches
6-inches	18'-9" to 22'-11"	20 gage (30 mil)	16-inches
*Heights/Lengths outside these limits will require additional bracing. Reference Drawings for details.			

- D. Contractor's Option: In lieu of traditional framing members, Contractor may use modified framing members of equivalent thickness for 20 and 25 gage metal such as ProSTUD Drywall Framing System by ClarkDietrich or comparable framing members by other manufacturers listed as members of SSMA, or SFIA.
- E. Partition Floor Tracks and Runners: AISI S 220 and ASTM C 645; galvanized sheet steel, channel shaped, same depth and gage as studs, tight fit; solid web.
- F. Deflection (Capture) Track: Deep leg track at roof deck or structure to provide vertical travel as indicated.
  1. Contractor's Option: Manufacturer's standard double or single deflection track as follows:
    - a. VertiClip or VertiTrack by The Steel Network. If this option is used, track may be 20 gage (30 mil) for all stud sizes.
    - b. FastTop Clip by ClarkDietrich.
    - c. MaxTrak or BlazeFrame by ClarkDietrich
    - d. SLP-TRK by Brady Innovations as distributed by CEMCO.
    - e. Comparable modified deflection tracks by other manufacturers listed as members of SSMA, or SFIA.
- G. Furring and Bracing: AISI S 220; galvanized sheet steel.
  1. Studs: ST25 - 2-1/2 inch deep, 25 gage (18 mil).
  2. Studs: ST25 - 3-5/8 inch deep, 25 gage (18 mil).
  3. Resilient Furring Channels: 1/2 inch deep x 2-1/2 inch wide, 25 gage (18 mil)
  4. Hat-Shaped Channels: 7/8 inch deep x 1-1/2 inch wide, 25 gage (18 mil).
  5. Cold-Formed Channels: 3/4 x 1/2 inch and 1-1/2 x 17/32 inch, 16 gage (54 mil).
  6. Z Furring Channel: 1-1/2 inch deep, 25 gage (18 mil).
  7. Clip Angles: 2 inches x 2 inches x 16 gage (54 mil) x 1/4 inch less than stud width.
  8. Contractor's Option: In lieu of cold-formed channels and clip angles for horizontal wall bridging, Contractor may provide one of the following:

- a. Bridge Bar by the Steel Network.
  - b. TradeReady Spazzer 9200 Bridging and Bracing Bar by ClarkDietrich.
  - c. Comparable products by other manufacturers listed as members of SSMA, or SFIA.
- H. Ceiling Joists, Tracks, Headers at Partition Openings, Framing Attachment Angles, and Fasteners: Specified in Section 05400.
- I. Partition Framing Fasteners: Corrosion-resistant self-drilling self-tapping steel screws.
- 1. 22 (27 mil) Gage Framing: ASTM C 1002; 3/8 inch Type S pan head.
  - 2. 20 (30 mil) Gage and Heavier Framing: ASTM C 954; 5/8 inch Type S-12 low-profile head.
- J. Bracing to Framing Attachment Angle Fasteners: #12 diameter pan head corrosion-resistant self-drilling screws.
- K. Partition Floor Track Anchorage Device: Low velocity powder-actuated drive pins; minimum 0.138 inch shank diameter x 1-1/2 inch shank length with 7/8 inch diameter washer.
- 1. Hilti PAT System using X-C 37 P8S36 Pins, by Hilti, Tulsa, OK, (800) 879-8000.
  - 2. Ramset/Red Head System using 1500SD Pins, by ITW Ramset/Redhead, Wood Dale, IL, (630) 350-0370.
- L. Wall Furring to Concrete or Masonry Wall Fasteners: Hex head sleeve anchors; minimum 1/4 inch diameter x minimum 1-1/8 inch embedment.
- 1. Slv Anch HLC-HX 5/16 x 2-5/8, by Hilti, Tulsa, OK, (800) 879-8000.
  - 2. Dynabolt HN-1413, by ITW Ramset/Redhead, Wood Dale, IL, (708) 350-1558.
- M. Furring Channel to Masonry or Concrete Surface Fasteners: Low velocity powder-actuated drive pins of size to suit application.
- N. Flat Straps and Backing Plates: ASTM A 653; galvanized sheet steel, gage, shape, and configuration as indicated on Drawings.
- 1. Contractor's Option: In lieu of 2-inch continuous metal strap, Contractor may provide one of the following:
    - a. Bridge Bar by The Steel Network.
    - b. TradeReady Spazzer 9200 Bridging and Bracing Bar by ClarkDietrich.
    - c. Comparable products by other manufacturers listed as members of SSMA, or SFIA.
- O. Suspension System:
- 1. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, double strand of 16 ga wire.
  - 2. Wire Hangers: ASTM A 641/A, Class 1 zinc coating, soft temper, 8 ga.
  - 3. Carrying Channels: AISI S 220; galvanized sheet steel, 1-1/2 x 17/32 inch, 16 gage (54 mil).
  - 4. Furring Channels: AISI S 220; galvanized, hat-shaped, rigid furring channels, 7/8 inch deep.
  - 5. Furring Channel Clips: AISI S 220; galvanized sheet steel, 1-1/2 inch.

## 2.3 GYPSUM BOARD MATERIALS

- A. Manufacturer: Subject to specified requirements, provide gypsum board and accessories by the following manufacturers:
- 1. [American Gypsum Company](#), Dallas, TX (800) 545-6302.
  - 2. [CertainTeed Corp](#), Tampa, FL. (800) 233-8990.
  - 3. [Georgia-Pacific](#), Atlanta, GA. (800) 284-5347.
  - 4. [James Hardie Building Products Inc.](#), Chicago, IL (888) 542-7343.
  - 5. [National Gypsum Company](#), Gold Bond Building Products, Charlotte, NC. (800) 628-4662.
  - 6. [USG Corporation](#), Chicago, IL. (800) 850-3839.
  - 7. [The Steel Network](#), Raleigh, NC (888) 474-4876. (Accessories only)
  - 8. [ClarkDietrich](#), West Chester, OH (513) 870-1100. (Accessories only).
  - 9. [Fry Reglet](#), (800) 237-9773. (Accessories only)
  - 10. Other manufacturers listed as members of SSMA, or SFIA.
- B. Standard Gypsum Board: Sheetrock, ASTM C 1396
- 1. Thickness: 1/2 inch and 5/8 inch thick

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2. Length, Long Edges, Cut: Maximum permissible length, edges tapered, ends square cut square.
  3. Provide one of the following:
    - a. Gypsum Wallboard by American Gypsum.
    - b. CertainTeed Regular Gypsum Board by CertainTeed.
    - c. ToughRock Gypsum Board by Georgia-Pacific.
    - d. Gold Bond Gypsum Board by National Gypsum.
    - e. Sheetrock Gypsum Panel by USG.
- C. Water Resistant Gypsum Board: ASTM C 1396.
1. Thickness: ½ inch thick
  2. Length, Long Edges, Cut: Maximum permissible lengths, edges tapered, ends square cut square.
  3. Core: Moisture or mold resistant core.
  4. Mold Resistance: Score of 10 when tested in accordance with ASTM D 3273/3274.
  5. Provide one of the following:
    - a. M-Bloc Mold and Moisture Resistant by American Gypsum.
    - b. M2Tech Gypsum Board by CertainTeed.
    - c. DensArmor Plus by Georgia-Pacific.
    - d. Gold Bond Brand XP Gypsum Board by National Gypsum.
    - e. Sheetrock Brand Mold Tough Gypsum Panel by USG.
- D. Fire Resistant Gypsum Board: ASTM C 1396, Type X
1. Thickness: 5/8 inch
  2. Length, Long Edges, Cut: Maximum permissible lengths, edges tapered, ends square cut.
  3. Provide one of the following products:
    - a. FireBloc Type X by American Gypsum.
    - b. CertainTeed Type X Gypsum Board by CertainTeed.
    - c. ToughRock Fireguard X by Georgia-Pacific.
    - d. Gold Bond Fire Shield by National Gypsum.
    - e. Sheetrock Firecode X Gypsum Panel by USG.
- E. Water and Fire Resistant Gypsum Board: ASTM C 1396, Type X
1. Thickness: 5/8 inch.
  2. Length, Long Edges, Cut: Maximum permissible lengths, edges tapered, ends square cut.
  3. Core: Non-combustible fire-resistant and mold resistant core.
  4. Mold Resistance: Score of 10 in accordance with ASTM D3273/3274.
  5. Provide one of the following:
    - a. M-Bloc Mold Resistant Type C by American Gypsum.
    - b. Gold Bond Brand XP Fire-Shield C Gypsum Board, by National Gypsum.
    - c. Sheetrock Mold Tough Firecode Type X Gypsum Panel, by USG.
    - d. ToughRock Fireguard X Mold-Guard Gypsum Board by Georgia Pacific.
    - e. M2Tech Type X Gypsum Board or Diamondback Glasroc Tile Backer Type X by CertainTeed.
- F. Abuse Resistant Gypsum Board: ASTM C 1396, Type X.
1. Thickness: As shown on drawings.
  2. Length, Long Edges, Cut: Maximum permissible length, edges tapered, ends cut square.
  3. Core: Enhanced and mold resistant gypsum core.
  4. Mold Resistance: Score of 10 in accordance with ASTM 3273/3274.
  5. Surface Abrasion: Meets or exceeds ASTM C 1629, Classification Level 1.
  6. Surface Indentation: Meets or exceeds ASTM C 1629, Classification Level 1.
  7. Soft-Body Impact: Meets or exceeds ASTM C 1629, Classification Level 1.
  8. Provide one of the following products:
    - a. M-Bloc AR Type X by American Gypsum.
    - b. SHEETROCK Brand Abuse Resistant Firecode X Gypsum Panel by USG.
    - c. Gold Bond Brand Hi-Abuse XP Fire-Shield by National Gypsum.
    - d. AirRenew Extreme Abuse Type X Gypsum Board by CertainTeed.
    - e. ToughRock Fireguard X Abuse Resistant Gypsum Board by Georgia-Pacific.

- G. Abuse and Water Resistant Gypsum Board: ASTM C 1396, Type X.
1. Thickness: As shown on drawings.
  2. Length, Long Edges, Cut: Maximum permissible length, edges tapered, ends cut square.
  3. Core: Enhanced and mold resistant gypsum core.
  4. Mold Resistance: Score of 10 in accordance with ASTM 3273/3274.
  5. Surface Abrasion: Meets or exceeds ASTM C 1629, Classification Level 1.
  6. Surface Indentation: Meets or exceeds ASTM C 1629, Classification Level 1.
  7. Soft-Body Impact: Meets or exceeds ASTM C 1629, Classification Level 1.
  8. Provide one of the following products:
    - a. M-Bloc AR Type X by American Gypsum.
    - b. ToughRock Fireguard X Abuse Resistant Gypsum Board by Georgia-Pacific.
    - c. Gold Bond Brand Hi-Abuse XP Fire-Shield by National Gypsum.
    - d. AirRenew Extreme Abuse Type X Gypsum Board by CertainTeed.
    - e. SHEETROCK Brand Mold Tough® AR Firecode® X Panels by USG.
- H. Prefinished Gypsum Board: Panel faces and edges wrapped with decorative vinyl, ASTM C 1396, Regular and Type X.
1. Thickness: As shown on drawings.
  2. Length, Long Edges, Cut: Maximum permissible length, edges tapered, ends cut square.
  3. Core: Standard and Type X gypsum cores.
  4. Surface Abrasion: Meets or exceeds ASTM D 1044.
  5. Provide one of the following products:
    - a. Gold Bond Brand Durasan Prefinished Gypsum Board by National Gypsum. Pattern: Group 1 – Stipple. Color: Off White
  6. Accessory trims: Trims for outside and inside corners, end caps, and dividers of vinyl laminated to extruded vinyl form, color matched to panel.
- I. Exterior Gypsum Soffit Board: ASTM C 1396, Type X, 5/8” thick, gypsum wallboard manufactured to produce extra resistance to moisture and sagging.
1. ProRoc Brand Exterior Soffit Board by CertainTeed.
  2. DensArmor Plus by Georgia-Pacific.
  3. Gold Bond Brand Exterior Soffit Board by National Gypsum.
  4. Type X Soffit Board by Temple Inland.
  5. Sheetrock Brand Exterior Gypsum Ceiling Board by USG .
- J. Gypsum Board Fasteners:
1. Metal Framing: ASTM C 954 and C 1002, Type S-12 bugle head, corrosion-resistant self-drilling self-tapping steel screws.
    - a. One Layer ½ Inch: 1 inch.
    - b. One Layer 5/8 Inch: 1-1/8 inch.
    - c. Two Layers: 5/8 Inch: 1-7/8 inch.
  2. Wood Furring: ASTM C 1002, 1-1/4 inch, Type W bugle head, corrosion-resistant self-drilling steel screws.
- K. Gypsum Board Accessories:
1. Corner Beads: Sheetrock Brand No. 104 Dur-A-Bead galvanized steel corner bead by USG.
  2. Edge Trim: Galvanized steel casing.
    - a. No. 200-B, L shape by USG for tight abutment at edges.
    - b. No. 200-A, J shape by USG at other locations.
  3. Control Joint Accessory Piece:
    - a. No. 093 roll-formed zinc by ClarkDietrich.
  4. Vertical Movement Joint Trim:
    - a. No DRMZ-625-200 aluminum Z shape trim by Fry Reglet.
  5. Adhesive:
    - a. Commercial Adhesive complying with ASTM C 557.
  6. Acoustical Insulation:
    - a. Unfaced fiberglass batts specified in Section 07210.
  7. Firestopping:

- a. Specified in Section 07840 for penetrations of fire-resistive rated gypsum board.

## 2.4 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475.
- B. Joint Tape:
  - 1. Interior Gypsum Wallboard: Paper tape.
  - 2. Exterior Gypsum Soffit Board: Paper tape.
  - 3. Gypsum Sheathing Board: 10/10 grid glass mesh tape.
  - 4. Backer Panels:
    - a. Glass-Mat Backer Material: 10/10 grid glass mesh tape.
- C. Joint Compound
  - 1. Interior Gypsum Wallboard:
    - a. Sheetrock Brand Ready-Mixed Lightweight All-Purpose Joint Compound with Dust Control, by USG.
    - b. ProForm Lite Ready Mix Joint Compound with Dust-Tech by National Gypsum.
  - 2. Exterior Applications:
    - a. Exterior Gypsum Soffit Board: Use setting-type taping compound and setting-type, sandable topping compound.
    - b. Gypsum Sheathing Board: As recommended by sheathing board manufacturer.
  - 3. Backer Panels:
    - a. Glass-Mat Backer Materials: Use setting-type taping compound as recommended by backer panel manufacturer and that is rated 10 when tested in accordance with ASTM D 3273 and evaluated in accordance with ASTM D 3274.

## 2.5 GYPSUM SHEATHING BOARD

- A. ASTM C 1396 and ASTM C 1177; water resistant gypsum core surfaced on face and back with inorganic glass fiber mats; thickness shown on the Drawings, maximum permissible lengths; ends square cut. Provide one of the following products:
  - 1. GlasRoc Brand Sheathing as manufactured by CertainTeed.
  - 2. Dens-Glass Gold gypsum sheathing as manufactured by Georgia-Pacific.
  - 3. eXP Sheathing by National Gypsum.
  - 4. GreenGlass sheathing by Temple-Inland.
  - 5. SecureRock by USG.
- B. Sheathing Board Fasteners: ASTM C 954 and ASTM C 1002, 1 inch length for ½ inch sheathing board and 1-1/4 inch length for 5/8inch thick sheathing board, Type S-12 bugle head, corrosion-resistant self-drilling steel screws.

## 2.6 BACKER MATERIALS

- A. Fiber Cement Backing Board: ASTM C 1278/1288, bonded, moisture and mold-resistant cementitious backing panels as follows where indicated to receive cement board, cement backer board, or cementitious backer board.
  - 1. Hardie Backer by James Hardie.
  - 2. Fiberock by USG.
  - 3. Thickness: ½-inch, ¼-inch, or other as shown on Drawings.
- B. Glass-Mat Backer Materials: Provide glass-mat moisture resistant gypsum core backer materials complying with ASTM C 1178. Glass-Mat Backer Material shall score a rating of 10 when tested according to ASTM D 3273. Thickness as shown on the Drawings. Provide Type X where required as shown on Drawings. Provide one of the following products:
  - 1. GlasRoc Tilebacker by Certainteed.
  - 2. DensShield Tile Backer by Georgia Pacific.
  - 3. GreenGlass Tile Backer by Temple-Inland.
  - 4. Gold Bond e<sup>2</sup>XP Tile Backer by National Gypsum.

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- C. Provide fiberglass matt faced high density polyiso board as follows as option to where indicated to receive glass-mat backer material behind tile.
  - 1. Waterproof Tile Backer Board: GoBoard by Johns Manville, Denver, CO (303) 978-2000.
  - 2. Thickness as indicated on drawings.

## 2.7 TEXTURE FINISHES

- A. Primer: As recommended by textured finish manufacturer.
- B. Provide textured finish as specified in Publication SA 933 of the United States Gypsum Co. (USG), or equivalent by other wallboard manufacturers.
  - 1. Vision Center: Medium knock-down pattern.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine existing conditions and adjacent areas where products will be installed and verify that conditions conform to product manufacturer's requirements. Verify that building framing components are ready to receive Work. Verify that rough-in utilities are in-place and located where required. Do not proceed until unsatisfactory conditions have been corrected.
- B. Examine panels to assure they are dry and free of moisture and mold damage as evidenced by discoloration, sagging, irregular shape, fuzzy or splotchy surface contamination, and discoloration.
- C. Beginning of erection and installation indicates acceptance of existing conditions.

### 3.2 INTERFACE WITH OTHER WORK

- A. Coordinate erection of studs with hollow metal door and window frames, sliding window, and overhead coiling door frames.
- B. Coordinate installation of anchors, supports, and blocking for mechanical, electrical, and building accessory items installed within framing.

### 3.3 INSTALLATION - STEEL FRAMING, GENERAL

- A. Installation Standards: Comply with ASTM C 754, and ASTM C 840 requirements that apply to framing installation and with further details and instruction by gypsum board manufacturer's written construction guidelines.
- B. Install supplementary framing, blocking, and bracing at terminations in gypsum board assemblies to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction. Comply, if none available, with USG's "Gypsum Construction Handbook."

### 3.4 INSTALLATION - PARTITION FRAMING

- A. Install studs and fasteners in accordance with manufacturer's published instructions, ASTM C 754, GA-216, and GA-600.
- B. Install bracing at terminations in assemblies.
- C. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.
- D. Install studs so flanges within framing system point in same direction.
- E. Metal Stud Spacing: Unless otherwise noted on Drawings, provide interior framing at maximum spacing specified

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herein at 2.2C. Provide spacing of 16 inches on center maximum for walls to receive ceramic tile.

- F. Align stud web openings horizontally.
- G. Splice studs with minimum 8 inch nested lap, fasten each stud flange with minimum two screws.
- H. Construct corners using minimum three studs.
- I. Place studs as indicated on Drawings, minimum 2 inches from abutting walls.
- J. Install headers and jambs at partition openings using load-bearing C-shaped studs as noted on Drawings and as specified in Section 05400.
- K. Install framing between studs for attachment of mechanical and electrical items.
- L. Install intermediate studs above and below openings to match wall stud spacing.
- M. Install tracks (runners) at floors and overhead supports. Refer to Drawings for indication of partitions extending to finished ceiling only and for partitions extending through ceiling to building structure above.
- N. Maintain clearance under structural members to avoid deflection transfer to studs.
  - 1. Where indicated, construct partition to accommodate vertical deflection.
  - 2. Install optional products specified in Part 2 above in accordance with manufacturer's printed instruction.
    - a. Install clip with step bushing in center of slotted hole.
    - b. Use a minimum of two fasteners per clip leg to connect clip to structure and partition framing.
    - c. Attach clip to each stud by screwing through the center of each step bushing.
- O. Fasten studs adjacent to door and window frames, partition intersections, and corners to top and bottom runner flanges in double-stud fashion with metal lock fastener tools.
  - 1. Securely fasten studs to jamb and head anchor clips of door and borrowed-light frames.
  - 2. Place horizontally a cut-to-length section of runner with web-flange bend at each end, fasten with minimum one screw per flange.
  - 3. Position a cut-to-length stud (extending to top runner) at vertical panel joints over door frame header.
- P. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.
- Q. Lateral Bracing for Metal Studs:
  - 1. In metal stud partitions and bulkheads where length of metal studs is over 8 feet, install lateral bracing using one of the following methods:
    - a. Install 1-1/2 inch cold-formed channel through stud web holes and screw attach in place with clip angles. Lap channels by nesting one inside the other to a depth of at least 8 inches and wire tie together.
    - b. Install optional products specified in Part 2 above in accordance with the manufacturers printed instructions.
    - c. Install field-cut runner for solid bridging at each end of wall, adjacent to wall openings, and 10 feet on center maximum. Install 1-1/2 inch wide, 20 (30 mil) gage strap bracing on both sides of stud. Fasten strap bracing to each solid bridging runner section with four screws.
  - 2. Gypsum Board Partitions: Space lateral bracing at the following intervals:
    - a. Partitions sheathed with gypsum board full height, each side: Provide bracing at mid-height.
    - b. Partitions sheathed with gypsum board partial height (one or both sides): Provide bracing at 48-inches on center for unsheathed height of partition.
  - 3. Wire Mesh Partitions: Space lateral bracing at the following intervals:
    - a. Stud Length Greater Than 8 Feet: Provide bracing at 60-inches on center.
- R. Install braced framing of steel stud framing as indicated on Drawings. Use only screw attachments.
- S. Blocking: Screw attach wood blocking between studs. Install blocking for support of plumbing fixtures, toilet



partitions, wall cabinets, toilet accessories and hardware.

- T. Framing Fastening: Fasten framing in accordance with manufacturer's published instructions and schedule below, unless indicated otherwise on Drawings.

Connection	Fastener
Floor Track to Concrete	1 - Pin at 32 inches on center
Partition Stud to Floor Track	1 - Screw each side at each flange
Stud Brace Web to Stud Web	2 - Screws
Plates and Straps to Studs	2 - Screws
Stud Web to Stud Web	2 - Screws
Stud Brace Web to Attachment Angle	2 - Screws
Lateral Bracing to Partition Stud Using Clip Angles	2 - Screws to stud and 2 - Screws to cold rolled channel
Runner to Header	1 - Screw at 16 inches on center, maximum 6 inches from each end

### 3.5 INSTALLATION - SUSPENDED CEILING

- A. Unless otherwise shown, install suspended ceilings in accordance with the following requirements.
- B. Suspend ceiling hangers from building structure as follows:
1. Install carrying channels 4 feet on center with hanger wire spaced a max of 4 feet on center along carrying channels. Attach furring channels spaced 16 inches on center perpendicular to carrying channels with double strand of saddle tied tie wire or furring channel clips. Apply 1/2 inch gypsum board with its long dimension at right angles to the furring channels. Attach gypsum board with 1 inch self drilling drywall screws 12 inches on center in the field of the board 8 or 12 inches on center at butt joints, located not more than 1/2 inches from edges.
  2. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or ceiling suspension system. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
  3. Where width of ducts and other construction within ceiling plenum produces hanger spacing that interferes with the location of hangers required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.
  4. Secure wire hangers by looping and wire-tying, either directly to structures or to inserts, eyescrews, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause them to deteriorate or otherwise fail.
  5. Do not attach hangers to steel deck tabs.
  6. Do not attach hangers to steel roof deck. Attach hangers to structural members.
  7. Do not connect or suspend steel framing from ducts, pipes, or conduit.
- C. Installation Tolerances: Install steel framing components for suspended ceilings so members for panel attachment are level to within 1/8 inch in 12 feet measured lengthwise on each member and transversely between parallel members.
- D. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.

### 3.6 INSTALLATION - FURRING

- A. Furring Channels:
1. Attach vertically spaced at maximum 16 inches on center, to masonry and concrete surfaces with hammer set or powder driven fasteners staggered 24 inches on center on opposite flanges.
  2. Nest channels 8 inches at splices and anchor with 2 fasteners in each wing.

- B. Wall Furring:
  - 1. Secure top and bottom runners to structure.
  - 2. Space metal studs at maximum 16 inches on center.
  - 3. Furring for Fire Rating: Install metal furring as required for fire resistance ratings indicated on Drawings, and to GA-600 requirements.

### 3.7 INSTALLATION - ACOUSTICAL INSULATION

- A. Place acoustical insulation in partitions tight within spaces, around cut openings, behind and around electrical and mechanical items within or behind partitions, and tight to items passing through partitions as specified in Section 07210 where shown on Drawings.

### 3.8 INSTALLATION - GYPSUM BOARD

- A. Install gypsum board in accordance with manufacturer's published instructions, ASTM C 840, GA-216, and GA-600.
  - 1. Use water resistant gypsum board at wet areas including walls and ceiling in toilet rooms, janitor closets, and food prep areas as applicable and where shown.
  - 2. Use fire resistant gypsum board at locations of fire-resistive rated assemblies indicated on Drawings.
  - 3. Use water and fire resistant gypsum board at locations of fire-resistive rated assemblies where water resistant gypsum board is specified.
  - 4. Use standard gypsum board at locations not indicated to be fire resistant or water resistant type.
- B. Use proper dust control tools and methods when scoring, breaking, and otherwise handling gypsum board.
- C. Where applicable, install ceiling panels before the installation of wall panels.
- D. Erect single layer gypsum board in most economical direction in accordance with ASTM C 840, with attachment to firm bearing surfaces over framing members. Do not align panel joints with edges of openings.
- E. Double Layer Applications: Secure second layer to first with screws; apply second layer with screws, staggering joints with those of first layer. Use adhesive only to hold second layer until screwed in place. Use fire rated gypsum backing board for fire rated partitions.
- F. Treat cut edges, holes, fastener heads, and joints, including those at angle intersections, in water resistant gypsum board and exterior gypsum soffit board with specified joint compound. Treat prior to installation.
- G. Place gypsum panels over supporting framing members with panel ends aligning and parallel with framing members. Leave bottom edge spacing above floor in accordance with GA-216.
- H. Install fasteners spaced and located in accordance with GA-216 or ASTM C840.

### 3.9 INSTALLATION - GYPSUM SHEATHING

- A. Install gypsum board sheathing in accordance with manufacturer's published instructions, GA-216 and GA-600.
- B. Erect single layer gypsum board horizontally with attachment to firm bearing.
- C. Place edge trim where gypsum board abuts dissimilar materials. Use longest practical length.
- D. Using screws, attach panels in place at maximum 12 inches on center, perimeter and field, to supporting framing.
- E. Protect exposed gypsum core at perimeter edges and penetrations by covering core with metal trim.

### 3.10 INSTALLATION - BACKER MATERIALS

- A. Install glass-mat backer materials where indicated to receive glass-mat backer material. Install in accordance with 09250-11

manufacturer's instructions.

### 3.11 INSTALLATION - JOINT TREATMENT

- A. Install joint treatment in accordance with GA-216.
- B. Install corner bead, trim, and casing in accordance with GA-216.
- C. Install control joints full height of partition with 1/2 inch gap between board edges and between studs. Control joints shall be installed in accordance with the gypsum manufacturer's recommended guidelines for control joints or the Gypsum Association GA-234 for control joint in fire rated systems. Apply sealant at base of joint and control joint accessory piece at face. Install control joints at the following locations:
  - 1. Where a wall or partition runs in an uninterrupted straight plane exceeding 30 linear feet.
  - 2. At pairs of doors, install vertical control joint at each jamb. At single doors, install control joint at latch side of jamb.

### 3.12 FINISH

- A. Apply gypsum board finish in accordance with manufacturer's published instructions and GA-214 Finish Levels.
- B. Provide gypsum board finish levels at locations as follows:
  - 1. Level 0 (GA-214): No taping, finishing, or accessories necessary.
    - a. Projects including exposed surfaces above 12 ft high.
  - 2. Level 1 (GA-214): Joints and interior angles have tape embedment set in joint compound. Surface free of excess joint compound. Tool Marks and ridges are acceptable.
    - a. Areas above ceilings where required by drawings.
    - b. Concealed areas.
    - c. Interior exposed gypsum surfaces not indicated to be painted.
  - 3. Level 3 (GA-214): Joints and interior angles have tape embedded in joint compound and one additional coat of joint compound is applied over all joints and interior angles and two additional coats of joint compound are applied over fastener heads and accessories. Surface smooth and free of tool marks and ridges.
    - a. Interior gypsum surfaces indicated to be painted.
    - b. Exterior exposed gypsum surfaces.
- C. Textured Coating.
  - 1. Apply textured coating to gypsum board surfaces as scheduled on the drawings.
    - a. Surface Preparation and Primer: Prepare and apply primer to gypsum panels and other surfaces receiving texture finishes. Apply primer to surfaces that are clean, dry, and smooth.
    - b. Texture Finish Application: Mix and apply finish using powered spray equipment, to produce a uniform texture free of starved spots or other evidence of thin application or of application patterns.
    - c. Prevent texture finishes from coming into contact with surfaces not indicated to receive texture finish by covering them with masking agents, polyethylene film, or other means. If, despite these precautions, texture finishes contact these surfaces, immediately remove droppings and overspray to prevent damage according to texture-finish manufacturer's written recommendations.

### 3.13 FIELD QUALITY CONTROL

- A. Inspect metal framing erection, placement, spacing, fasteners, and connections to building.
- B. Inspect gypsum board installation, fastener type, spacing, and finish level.
- C. Inspect installation of firestopping penetrations of fire-restive rated partitions and at voids between top of partition and building structure.
- D. Correct deficiencies in Work which inspection indicates are not in compliance with Contract Documents.

### 3.14 PROTECTION

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- A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces.
- B. Protect installed interior non load-bearing steel stud partition framing, gypsum board, backer materials, and gypsum sheathing from damage until Substantial Completion.

END OF SECTION

## SECTION 09310 - CERAMIC TILE

## PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Owner furnished new and replacement ceramic wall tile, floor tile, and accessories for installation by Contractor.
- B. Related Requirements: The following list is intended to aid in locating products and work related to or dependent on the scope in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
  - 1. Section 01351 – Regulatory Compliance.
  - 2. Section 07900 - Joint Sealers: Sealant at tile penetrations and control/construction joints.
  - 3. Section 09250 - Gypsum Board Systems: Wall tile substrate.
  - 4. Section 09330 – Quarry Tile.
  - 5. Appendix A – Products and Work by Owner or Separate Contractor: Manufacturers, suppliers, product information, installation (if applicable), and general procedures related to Owner furnished products.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. American National Standards Institute (ANSI):
  - 1. ANSI A108/A118/A136.1 – Specifications for the Installation of Ceramic Tile.
    - a. A108 – Installation Standards:
      - 1) .02 – General Requirements: Materials, Environmental, and Workmanship.
      - 2) .5 – Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar
      - 3) .15 – Alternate Method: Installation of Paper-Faced Glass Mosaic Tile.
- C. Occupational Safety and Health Administration (OSHA):
  - 1. OSHA 01926.1153 Respirable Crystalline Silica.
- D. Tile Council of America, Inc. (TCA):
  - 1. TCA Handbook for Ceramic Tile Installation.

## 1.3 ENVIRONMENTAL REQUIREMENTS

- A. Minimize dust emissions or provide equipment that suppresses dust.

## 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Owner's Supplier will deliver products as specified in Section 01600 – Owner Furnished Products Requirements.
- B. Receive Owner Furnished products in accordance with the requirements of Section 01600.
  - 1. Product Delivery: Owner's Supplier will deliver Owner furnished products to site to be received by

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Contractor. Contact Owner's Suppliers to coordinate delivery of Owner furnished products and materials.

- C. Store packaged materials in original containers with seals unbroken and labels intact until time of use.
- D. Prevent damage or contamination to materials by water, freezing, foreign matter, and other causes.

#### 1.5 SITE CONDITIONS

- A. Do not install adhesives in a closed, unventilated environment.
- B. Maintain 50 degrees F during installation of mortar materials.

### PART 2 PRODUCTS

#### 2.1 OWNER FURNISHED PRODUCTS

- A. Owner's Supplier will furnish ceramic tile and accessories as specified in Appendix A (Section 09310) for installation by Contractor.

### PART 3 EXECUTION

#### 3.1 EXAMINATION

- A. Examine surfaces and adjacent areas where products will be installed and verify that surfaces conform to product manufacturer's requirements for substrate conditions. Do not proceed until unsatisfactory conditions have been corrected.
- B. Beginning of installation indicates acceptance of substrate conditions.

#### 3.2 PREPARATION

- A. Mix mortars and grouts to comply with requirements of referenced standards and manufacturers for proportioning of materials, water or additive content; type of mixing equipment, selection of mixer speeds, mixing containers, and mixing time to produce mortars and grouts of uniform quality with optimum performance characteristics for application indicated.
- B. Protect surrounding work from damage or disfiguration.
- C. Prepare substrate surfaces which do not need joint repair with sealers or conditioners as recommended by adhesive manufacturer.

#### 3.3 INSTALLATION

- A. ANSI Tile Installation Standards: Comply with parts of ANSI A108 Series "Specifications for Installation of Ceramic Tile" that apply to types of setting and grouting materials shown and specified.
- B. TCA Installation Guidelines: TCA's "Handbook for Ceramic Tile Installation." Comply with applicable TCA installation methods.
- C. Building Tape: Install at base of wall or at joints as shown on the drawings. Install in accordance with manufacturer's instructions.

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- D. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.
  - 1. Lay tile to grid pattern shown at vestibule. Customers must have access to at least half the vestibule entrance at all times.
- E. Cut tile using saws equipped with integrated water delivery system that continuously feeds water to the blade.
- F. Fit tile tight to penetrations. Form corners and bases neatly. Align floor and base joints.
- G. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make joints watertight, without voids, cracks, excess mortar, or excess grout.
- H. Sound tile after setting. Replace hollow sounding units.
- I. Transition Strip: Install transition strip at transitions between ceramic tile and concrete or VCT. Install during tile placement in accordance with edge strip manufacturer's instructions.
- J. Expansion Joints: Provide tile expansion joints at control/construction joints in concrete slab. Keep joints free of mortar or grout.
  - 1. Installation Method: TCA EJ171.
- K. Allow tile to set for a minimum of 48 hours prior to grouting.
- L. Grout tile joints.
  - 1. Grout space shall be 1/8-inch for all tile joints unless otherwise noted on Drawings.
- M. Apply sealant to junction of tile and dissimilar materials at tile penetrations and at tile expansion joints at areas receiving tile, including areas where tile installed by Preferred Flooring Contractor.

### 3.4 FIELD QUALITY CONTROL

- A. Inspect ceramic tile installation, joints, grout line alignment, and attachment to substrate.
- B. Correct deficiencies in Work which inspection indicates are not in compliance with Contract Documents.

### 3.5 CLEANING

- A. Remove excess mortar and grout from floor, base, and wall surfaces without damage.
- B. On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
  - 1. Initially clean and remove grout residue from tile as soon as possible according to tile and grout manufacturer's written instructions. Use cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.
  - 2. Begin final cleaning approximately 1 hour after initial cleaning of the grout. Mix cleaning additive to 2 gallons of clean, cool water. Use a white scrub pad to lightly scrub apart any of the leftover residue remaining on the surface of the tile. Drag a clean, damp sponge diagonally over the scrubbed surfaces to remove any froth and residue. Rinse sponge often and change water every 50 square feet of surface. Allow cleaned areas to dry and inspect entire surface of tile. Repeat if haze remains.
  - 3. If haze remains 24 hours after installation, clean surfaces using straight white vinegar or bleaching type cleanser by methods described in preceding paragraph.

- C. Dispose of construction waste in accordance with the requirements of Section 01351.
- D. Perform final cleaning of tile with cleaning materials recommended by tile manufacturer one day prior to Date of Substantial Completion.

3.6 PROTECTION

- A. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. If recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors.
- B. Prohibit traffic from floor finish for 72 hours after installation.

END OF SECTION



## SECTION 09511 - ACOUSTICAL PANEL CEILINGS

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Suspended metal grid ceiling system.
  - 2. Acoustical panels.
  - 3. Perimeter trim.
  - 4. Column trim.
  - 5. Fire rated assembly.
  
- B. Related Requirements: The following list is intended to aid in locating products and work related to or dependent on the scope in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
  - 1. Section 01351 - Regulatory Compliance: References to Contract Provisions for removal and recycling of acoustical ceiling tile.
  - 2. Section 13900 - Fire Suppression: Sprinkler heads in ceiling system.
  - 3. Section 15800 - Air Distribution: Air diffusion devices in ceiling system.
  - 4. Section 16500 - Lighting: Light fixtures attached to ceiling system.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are reference within the text by these basic designations only.
  
- B. ASTM International (ASTM):
  - 1. ASTM C 635 - Specification for Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
  - 2. ASTM C 636 - Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.
  - 3. ASTM C 1858 – Direct Hung Suspended T-bar Type Ceiling Systems Intended to Receive Gypsum Panel Products in Areas Subject to Earthquake Ground Motions.
  - 4. ASTM E 84 - Test Method for Surface Burning Characteristics of Building Materials.
  - 5. ASTM E 580 - Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions.
  - 6. ASTM E 1264 - Acoustical Ceiling Products.
  
- C. American Society of Civil Engineers (ASCE):
  - 1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.

## 1.3 SUBMITTALS

- A. Comply with the requirements of Section 01330.
  
- B. Product Data. Provide manufacturer's product data for suspension systems, showing all components.
  
- C. Shop Drawings: Show the following:
  - 1. Layout of grid components and hanger spacing, including perimeter support wires.
  - 2. Locations and methods of attachment of grid to walls. Clearance where grid is not attached to walls.
  - 3. Connection of ends of main beams and cross tees.
  - 4. Locations and details of compression struts and horizontal restraint wires or rigid bracing.
  - 5. Locations and details of seismic separation joints.
  - 6. Bracing for changes in ceiling plane.
  - 7. Locations and support details for light fixtures, diffusers, and other items within the ceiling system.

- D. Evaluation Report: ICC-ES report verifying code compliance for systems with alternative materials, design or methods of construction not specifically prescribed by the building code.

#### 1.4 SYSTEM DESCRIPTION

- A. Design Requirements:
  - 1. Rigidly secure acoustical ceiling system including integral mechanical and electrical components with maximum deflection of 1/360.
  - 2. Conform to Underwriters Laboratories (UL) Fire Resistance Rating design Number for roof/ceiling assembly indicated on Drawings.

#### 1.5 DELIVERY, STORAGE AND HANDLING

- A. Section 01600 - Product Requirements: Transport, handle, store, and protect products.
- B. Deliver acoustical units in manufacturer's original unopened containers with brand name and type clearly marked.
- C. Store under cover in dry, watertight conditions.
- D. Prior to installation, store acoustical units for 24 hours minimum at same temperature and relative humidity as space where Work will be installed.

#### 1.6 PROJECT CONDITIONS

- A. Environmental Requirements: Maintain uniform temperature range of 60-85 degrees F, and humidity of no more than 70 percent relative humidity prior to, during, and after installation.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Provide products by the following manufacturers as specified:
  - 1. Armstrong World Industries Incorporated, Lancaster, PA (800) 448-1405.
  - 2. CertainTeed Ceilings, Valley Forge, PA (800) 233-8990.
  - 3. [Rockfon](#), LLC (Formerly Chicago Metallic Corporation), Chicago, IL (800) 323-7164.
  - 4. Gold Bond Building Products, National Gypsum Company, Charlotte, NC (704) 365-7300.
  - 5. USG Interiors, Chicago, IL (800) 950-3839.

#### 2.2 REGULATORY REQUIREMENTS

- A. Surface Burning Characteristics in Accordance with ASTM E 84 for Class A finish:
  - 1. Flame Spread: Less than 25.
  - 2. Smoke Density: Less than 50.
- B. Seismic Performance: Acoustical ceiling shall withstand the effects of earthquake motions determined according to ASCE 7.
- C. Food Serving and Preparation Areas where Scheduled:
  - 1. United States Department of Agriculture (USDA): Approved for incidental food contact.
- D. Conform to Underwriters Laboratories (UL) Fire Resistance Design Number for roof/ceiling assembly indicated on Drawings.

#### 2.3 SUSPENSION SYSTEM

- A. Provide suspension system specified herein for the corresponding ACT system as applicable as shown on the drawings. Provide suspension system compatible with acoustical panels selected.

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- B. Grid: ASTM C635, intermediate duty, steel exposed T; nominal 1 inch width; stab-in connections.
- C. Accessories: Stabilizer bars, clips, and splices.
- D. Grid Finish:
  - 1. White, unless noted otherwise.
- E. Support System: Hot or cold rolled steel channels; galvanized hanger wire, minimum 12 gage.
- F. Edge Moldings: Metal channel with exposed flange to match suspension system.
  - 1. 7/8-inch wide horizontal leg.
- G. Hold-Down Clips:
  - 1. Heavy Duty Clip (Vision Center Vestibule): Armstrong Model EHDC58 hold-down clip.
- H. ACT-1 and ACT-3; Non Fire-Rated Suspension System: Provide one of the following:
  - 1. Prelude 15/16 inch, XL #7300 Exposed Tee System, by Armstrong.
  - 2. Classic Stab System, 15/16 inch, #C12-12-15, by CertainTeed.
  - 3. 1200 System, by Rockfon.
  - 4. Donn DX System, by USG.

I. Substitutions: Not Permitted.

#### 2.4 ACOUSTICAL LAY-IN PANELS

- A. Provide acoustical panels specified herein for the corresponding ACT system as applicable as shown on the drawings.
- B. ACT-1: Non Fire-Rated Panels. Square edge, white, nonperforated, abuse-resistant vinyl film facing, size as shown. Provide one of the following:
  - 1. Vinyl Faced Fiberglass Ceiling Panels, Random Fissured; Item #2911 by Armstrong.
    - a. Temporary Substitution: If Supplier indicates Armstrong's Item #2911 is unavailable, provide Georgian Square Lay-In Panels (Item #763) by Armstrong as an approved temporary substitution.
  - 2. Premier Hi-Lite ClimaPlus Kapok Panels, unperforated, Item #7057G, by USG.
  - 3. Versatone Unperforated Vintage Item #1530-VIN-1, by CertainTeed.
  - 4. Coral Soft Touch Series, Item #7010-01F, by Rockfon.
- C. ACT-1: Fire Rated Panels. Min. 1.0 lb/sq ft. (Density: 19.2 lb/cu.ft.), square edge, white, size as shown. Provide one of the following:
  - 1. Cortega Fire Guard #823, by Armstrong.
  - 2. Baroque Protectone, #PBT-197, by CertainTeed.
  - 3. Radar Auratone Firecode, #2315, by USG.
- D. ACT-2: Fire Rated Panels. Square edge, white, non-perforated vinyl-faced gypsum panels, which satisfy USDAFSIS guidelines for sanitary applications. Size as shown. Provide one of the following:
  - 1. #670 by Armstrong (available from select Armstrong distributors only).
  - 2. VinylRock, by CertainTeed.
  - 3. Sheetrock Lay-in Ceiling Panel ClimaPlus, by USG.
  - 4. Gridstone Brand Gypsum Ceiling Panels, by National Gypsum.
- E. ACT-3: Non Fire Rated Panels. Min. 1.00 pounds per square foot, angled tegular lay-in edge, white, factory-applied vinyl latex paint, perforated, and face-scored.
  - 1. Provide one of the following 24 in. x 48 in. panels for standard installations:
    - a. Cortega Second Look II, #2767 White, by Armstrong.
    - b. Baroque Customline Safetone Class A, BQCL-224, by CertainTeed.
    - c. Radar Illusion, Two/24, #2842 White, by USG.

2. Where required for existing conditions, provide 24 in. x 24 in. panels by the same manufacturer and series.

F. Substitutions: Comply with the requirements of Section 01600.

## 2.5 TRIM ACCESSORIES

A. Provide flexible curved angle trim for Sales Area Columns.

## PART 3 - EXECUTION

### 3.1 PREPARATION/DEMOLITION

A. Examine surfaces and adjacent areas where products will be installed and verify that surfaces conform to product manufacturer's requirements for substrate conditions. Do not proceed until unsatisfactory conditions have been corrected.

B. Coordinate extension of existing grid ceiling system if existing system is to remain.

C. Clean or paint existing grid as shown on Drawings prior to removal of "old" panels. Refer to Section 09900.

D. Remove existing ceiling panels as shown on Drawings. Store removed panels for recycling as referenced in Section 01351.

1. If ceiling batt insulation is present, remove, retain and re-install batts above new ceiling panels.

E. In new ceiling grid installation, verify that layout of hangers will not interfere with other Work.

F. Beginning of installation indicates acceptance of existing conditions.

### 3.2 INSTALLATION – GENERAL

A. Interface with Other Work:

1. Do not install acoustical ceilings until building is enclosed, heating is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.

2. Schedule installation of acoustic units after interior wet work is completed.

3. Install after major above ceiling work is complete.

4. Coordinate location of hangers with other Work.

B. Site Tolerances:

1. Variation from Flat and Level Surface: 1/8 inch in 12 feet.

### 3.3 INSTALLATION - SUSPENSION SYSTEM

A. Install System in accordance with ASTM C636, select provisions of ASTM E 580, and manufacturer's published instructions.

B. Install system in accordance with UL Fire Resistance Rating Design Number for roof/ceiling assembly indicated on Drawings.

C. Rigidly secure acoustical ceiling system including integral mechanical and electrical components with maximum deflection of 1/360.

D. If metal deck is not supplied with hanger tabs, coordinate installation of hanger clips during steel deck erection. Provide additional hangers and inserts as required.

E. Hang system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members. Where ducts or other equipment prevent regular spacing of hangers, reinforce nearest affected hangers and related carrying channels to span extra distance.

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- F. Locate system on room axis to a balanced grid design with edge units no less than 50 percent of acoustical panel size where Reflected Ceiling Plan not shown on Drawings. Match direction of existing ceiling grid unless directed otherwise by the Drawings.
- G. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability. Do not eccentrically load system, or produce rotation of runners.
- H. Install edge molding at intersection of ceiling and vertical surfaces using longest practical lengths. Miter corners. Provide edge moldings at junctions with other interruptions. Secure at 16 inches on center.
- I. Install compression struts and secure system with tie wires.
  - 1. Do not fasten runner ends to perimeter enclosure and provide 3/8" clearance to vertical leg of perimeter enclosure.
  - 2. Prevent spreading of terminal ends of main runners and cross runners by installing stabilizer bars as indicated on Drawings.
    - a. As an alternative to stabilizer bars in Seismic Design Category C, another method or design for prevention of spread may be used if an ICC-ES report verifies compliance of the alternate method.
- J. Install additional 12 ga. tie wire from grid to structure to support Bakery/Deli Menu Board System (MBS). Additional wire to be installed at 4'-0" o.c. at or within 2'-0" of center line of MBS. Each MBS section (4'-6" or 8'-0" in length) to receive no less than three (3) additional 12 ga. tie wires. Install additional 12 ga. tie wire to mechanical registers or 2x4 light fixtures located within 12" of centerline of Bakery/Deli Menu Board System.]

#### 3.4 INSTALLATION - ACOUSTICAL PANELS

- A. Fit acoustic units in place free from damaged edges or other defects. Install acoustic units level, in uniform plane, and free from twist, warp, and dents.
- B. Within any enclosed room, do not mix panels of different brands.
- C. Construct light fixture boxes of gypsum board above light fixtures in accordance with UL fire Resistance Rating Design Assembly requirements.
- D. Install heavy duty hold-down clips to retain panels tight to grid system at each ceiling acoustical panel at Vision Center Vestibule.

#### 3.5 FIELD QUALITY CONTROL

- A. Field quality control shall be the responsibility of the Contractor in accordance with Section 01452. Except as specified as mandatory, field quality control testing and inspection shall be at the discretion of the Contractor as necessary to assure compliance with Contract requirements.
- B. Inspect acoustical panel placement, ceiling grid suspension system installation and connection to structure.
- C. Correct deficiencies in Work which inspection indicates are not in compliance with contract requirements.

#### 3.6 CLEANING

- A. Clean exposed surfaces of acoustical ceilings including trim, edge moldings, and suspension system members

END OF SECTION

## SECTION 09650 - RESILIENT FLOORING

## PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes:
1. Owner furnished resilient tile, adhesive, and accessories for installation by Owner's Preferred Flooring Contractor.
  2. Cleaning and finish floor treatment applications for resilient floor tile furnished and installed by Owner's Preferred Flooring Contractor.
- B. Related Requirements: The following list is intended to aid in locating products and work related to or dependent on the scope in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
1. Section 01351 - Regulatory Compliance.
  2. Section 02023 – Selective Site Demolition: Requirements for dust control during preparation of existing slabs to receive resilient flooring.
  3. Section 03314 - Cast-In-Place Concrete Slabs: Floor substrate surface.
  4. Section 09655 - Resilient Base and Accessories: Resilient flooring base.
  5. Appendix A – Products and Work by Owner or Separate Contractor: Manufacturers, suppliers, product descriptions, installation (if applicable), and general procedures related to Owner furnished products.
    - a. Products installed by Owner's Preferred Flooring Contractor.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by these basic designations only.
- B. ASTM International (ASTM):
1. ASTM F 710 – Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
  2. ASTM F 1869 – Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
  3. ASTM F 2170 – Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using *in situ* Probes.
- C. Occupational Safety and Health Administration (OSHA):
1. OSHA 01926.1153 Respirable Crystalline Silica.

## 1.3 QUALITY ASSURANCE

- A. Environmental Requirements.
1. Limit and control noise, dust and moisture created by concrete surface preparation work to meet local, state, and Federal ordinances, codes, and laws.
  2. Limit and control damage from dust caused by slab surface preparation.
- B. Owner's Preferred Flooring Contractor: The Owner's Preferred Flooring Contractor (PFC) is a firm hired by and contracted by the Owner for the purpose of executing installation work within the scope of this section. Owner's PFC shall be one the following as determined by Owner:
1. A&I Floor Covering: Contact Adam Difabrizio (801) 509-9587, or Israel Kingston (801) 509-9588.
  2. B&C Flooring: Contact Chuck Wood (435) 770-6844, or Tanica Wood (435) 770-6866.
  3. Jones Tile: Contact Donna Ray (573) 692-4033 or Clemet Jones (573) 836-0881.
  4. Kenjura Tile Inc.: Contact Rick Kenjura (979) 251-4543 or Mark Williams (979) 277-5919.
  5. RDR: Contact Rudy Reyna (210) 363-3787 or Dina M. Reyna (210) 520-1545, ext. 101.
  6. RMI: Contact D A Pope (229) 424-8411, Guntra Harper (229) 468-9822, or Keisha Davis (229)425-8842.

7. Robinett: Contact Jason Robinett (918) 837-1991.

#### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Owner's Supplier will deliver products as specified in Section 01600 – Owner Furnished Products Requirements.
- B. Product Packaging: Resilient flooring and accessories will be packaged in manufacturer's standard cartons.
- C. Receive Owner Furnished products in accordance with the requirements of Section 01600.
  - 1. Product Delivery: Owner's Supplier will deliver Owner furnished products to site to be received by Contractor. Contact Owner's Suppliers to coordinate delivery of Owner furnished products and materials.
- D. Storage:
  - 1. Store materials in a secure area to prevent loss due to theft or damage.
  - 2. Store flooring on original pallets with no multiple stacking of pallets.
  - 3. Store resilient flooring and adhesives indoors and protect from excessive cold, heat, temperature fluctuations, humidity, and moisture penetration.
  - 4. Do not allow adhesive to freeze.
  - 5. Storage Conditions:
    - a. Store flooring materials in environment between 65 and 85 degrees for three days prior to installation to achieve temperature stability.
      - 1) Coordinate location of storage with Walmart Construction Manager.
    - b. Maintain adhesives at a minimum temperature of 65 degrees F for 48 hours prior to installation.
- E. Transport, handle, and protect products in compliance with the requirements of Section 01600 and manufacturer's recommendations.

#### 1.5 REQUIREMENTS OF CONTRACTORS

- A. Preferred Flooring Contractor shall be responsible for:
  - 1. Complying with safety and badging requirements of the General Contractor.
  - 2. Attending communication meetings (lead installer).
  - 3. Tracking material usage and verifying quantities on hand are sufficient for Work.
  - 4. Coordinating with General Contractor for obtaining additional flooring (Add-on Orders).
  - 5. Return to project Site 7-14 days prior to Re-Grand Opening for required corrections.
- B. General Contractor shall be responsible for:
  - 1. Temporary electrical service for Preferred Flooring Contractor's equipment.
    - a. Refer to Section 01500.
    - b. Contact Preferred Flooring Contractor specified herein for temporary electrical requirements of equipment prior to submission of Bid.
  - 2. Disposal of waste generated by flooring activities including, but not limited to, opened adhesive containers.
  - 3. Disconnecting and reconnecting electrical power to all existing equipment and fixtures, including registers, required to be moved for installation of flooring.
  - 4. Attending Pre-Possession meeting to assist in determination of flooring installation and finishing schedule.
  - 5. Supervision of flooring scope of work and verification of conformance with the plans and specs.
  - 6. Escalating to Owner's Construction Manager any performance issues with Preferred Flooring Vendor.
  - 7. Submitting Flooring Add-on Order forms where required. Add-On Order forms may be procured from Owner's Construction Manager.
  - 8. Submitting Flooring Return Request form to appropriate Supplier and verifying receipt of required Return Authorization Documents.

#### 1.6 SCHEDULING

- A. Schedule resilient flooring installation to prevent damage to resilient flooring and to prevent movement of construction materials over area of resilient flooring.

- B. Work shall be performed in association with approved interruption of the Store's normal operations.

## PART 2 PRODUCTS

### 2.1 OWNER FURNISHED PRODUCTS

- A. Owner's Supplier will furnish the following for installation by Owner's Preferred Flooring Contractor (PFC) as specified in Appendix A (Section 09650).
  - 1. PVC/LVT Resilient Flooring.
  - 2. Flooring to Concrete Transition Strip and Fasteners.
  - 3. Flooring Adhesive.
- B. Owner's PFC will furnish and install the following as specified in Appendix A (Section 09650):
  - 1. Cleaning and finish floor treatment applications for new flooring or where shown.

### 2.2 SUPPLIERS

- C. Owner's Supplier of Vinyl Composition Tile (VCT) Flooring as specified herein for installation by Contractor:
  - 1. Armstrong Flooring, Inc., Kyle Stokley, Strategic Account Manager, (512) 590-9335, [kjstokley@armstrongflooring.com](mailto:kjstokley@armstrongflooring.com). Armstrong Flooring as supplied by Harnix Corp. (d/b/a/ Linron Company), Houston, TX (713) 802-9137, [shannon@linron.com](mailto:shannon@linron.com) or [amand@linron.com](mailto:amand@linron.com) for Remodels; [chelsea@linron.com](mailto:chelsea@linron.com) for Special Projects.

### 2.3 PRODUCTS – VCT

- A. Vinyl Composition Tile (VCT): ASTM F 1066, Class 1, solid-color tile or Class 2, through-pattern tile, non-asbestos formulated, 0.125 inch thick, 12 by 12 inches square, Standard EXCELON Imperial Texture or Safety Zone slip resistant by Armstrong. Pattern and color numbers listed below will be furnished as applicable on the drawings.
  - 1. VCT-9 (White): One of the following:
    - a. Armstrong 51899.
    - b. Armstrong 51530.
    - c. Armstrong 51989.
  - 2. VCT-11 (Cream): Textured Surface Tile, Linron SG856 Starburst.
  - 3. VCT-20 (Gray): Armstrong Z1904, Sterling
  - 4. VCT Adhesive:
    - a. Schonox VMI 91 Acrylic Adhesive for Resilient Flooring, by Schonox.

### 2.4 ACCESSORIES BY CONTRACTOR

- B. Subfloor Filler (Cementitious Based Underlayment):
  - 1. Schonox SL, by HPS North America, Inc. (256) 246-0345.
- C. Primers: Types as suitable for specific material and substrates encountered. Primer VOC shall be not greater than 50 g/L.
- D. Contraction/Construction Joint Filler:
  - 1. MasterSeal CR 190 (formerly Epolith P) two-part, 100% solids, flexible epoxy joint filler by Master Builders Solutions (800) 433-9517 or (800) 243-6739 (technical service)
  - 2. Do not use with Moisture Mitigation System specified above.

### 2.5 EQUIPMENT

- A. Dust extraction system and pre-separator for cleaning slab after surface preparation.
  - 1. Heavy-duty industrial HEPA filtration vacuum system, suitable for extracting and containing large quantities of fine concrete dust (minimum 350CFM air flow) in conjunction with manufacturer recommended pre-separator.
  - 2. Provide one of the following:

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- a. 86D, by HTC (877) 482-8700 [www.htc-america.com](http://www.htc-america.com).
- b. T8600, by Ermator LLC (855) 736-2869.
- c. Bull 1250, by SASE Company, Inc. (800) 522-2606 [www.sasecompany.com](http://www.sasecompany.com).

## PART 3 EXECUTION

### 3.1 PREINSTALLATION TESTING

- A. Bond Test: Conduct bond test of specified floor covering and specified adhesive in accordance with manufacturer's published instructions.

### 3.2 EXAMINATION

- A. Examine surfaces and adjacent areas where products will be installed and verify that surfaces conform to the following requirements for substrate conditions. Do not proceed until unsatisfactory conditions have been corrected.
  1. Verify concrete floors are free of excessive moisture, hydrostatic pressure, alkalinity, scale, and dusting.
  2. Verify concrete floors are plane to tolerances specified in Division 3 specifications.
  3. Verify concrete floors are free from oil, grease, dust, construction debris, loose or scaly paints or coatings, incompatible curing or sealing compounds, and other substances that may impair adhesion of adhesive and finish materials.
  4. Verify that storage conditions specified in Part 1 have been met.
- B. On remodel installations evaluate existing materials for suitability as a substrate.
- C. Beginning of installation indicates acceptance of substrate conditions.

### 3.3 PREPARATION – GENERAL

- A. Coordinate with Store Manager 48 hours prior to work.
- B. Cover and protect merchandise and racking to prevent damage or contamination of stored products. Provide dust drapes as required to protect merchandise from dust or debris.
- C. Comply with the requirements of Section 02023.
- D. Remove existing floor tiles if applicable. Demolished tile shall be disposed of or recycled in accordance with the Contract Provisions referenced in Section 01351.

### 3.4 PREPARATION – CONCRETE SUBSTRATE

- A. Unless otherwise specified herein, prepare substrate according to ASTM F 710.
- B. Remove paint, oils, waxes, sealers and curing compounds not compatible with adhesive to be used. Do not use organic solvents or liquid adhesive removers.
- C. Prepare concrete substrate according to flooring manufacturer's written recommendations and as outlined below to ensure adhesion of resilient products.
  1. Remove ridges, bumps, protrusions, and other irregularities.
  2. Where scraping, sanding, or grinding of concrete surface is required to remove existing oil, grease, coatings, or compounds, and where sanding or grinding of concrete surface is required to remove protrusions, use proper dust control tools and methods to maintain dust emissions below the permissible level.
  3. Properly prepare expansion joints and fill contraction/construction joints with joint filler or subfloor filler specified in Part 2 of this section as required. Do not seal joints in areas to receive resilient flooring using polyurea or epoxy joint filler specified for concrete slabs in other Sections.
  4. Fill cracks, holes, and depressions with cementitious based underlayment and finish smooth as necessary to achieve a level, flat, hard surface.
  5. Prohibit traffic until filler is cured. Thereafter, unnecessary traffic in work areas shall be kept to a minimum.

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6. Vacuum slab.
  - a. Use HEPA-rated filtration vacuum system during slab preparation.

### 3.5 INSTALLATION

- A. Begin resilient flooring installation only when slab moisture and pH conditions are satisfactory for placement as determined from results of pre-installation testing.
- B. Prepare concrete substrate according to flooring manufacturer's written recommendations and as outlined below to ensure adhesion of resilient products.
- C. Install resilient flooring in accordance with manufacturer's published instructions at locations indicated.
- D. Open number of floor material cartons to provide quantity required to cover each area; mix pieces within single shade lot to ensure shade variations do not occur within any one area. When working with more than one lot, plan lot placement and location to minimize possible shade differences.
- E. Apply adhesive in accordance with manufacturer's directions. Follow adhesives open time by spreading only enough adhesive to permit installation of floor materials before initial set. Do not spread adhesive for overnight dry.
- F. PVC/LVT Plank Flooring Installation:
  1. Install PVC/LVT flooring in accordance with manufacturer's published instructions. Lay flooring from side-to-side, not front-to-back, of store.
  2. Install PVC/LVT plank strips with random end-joint offset over entire area. Cut planks in random sizes for starter pieces and alternate the size of the starter piece to avoid a repeating joint pattern. The shortest starter piece shall be not less than 12" and the shortest end run piece shall be not less than 6".
  3. Overall PVC/LVT flooring layout shall produce a complete random appearance of joint spacing with end joints staggered a minimum of 6" apart.
  4. Install PVC/LVT border as shown on the drawings.
- G. VCT Flooring Installation:
  1. Lay flooring from center marks established parallel to building walls.
  2. Allow minimum ½ full size tile width at room or area perimeter.
  3. Adjust tile layout as required to avoid use of units less than ½ tile.
  4. Install tile to square grid pattern with all joints aligned.
    - a. Install smooth surface tile in alternating grain, basket weave pattern unless indicated otherwise on Drawings.
    - b. Install textured surface tile with all tiles in same grain direction. Grain direction shall be oriented side-to-side, parallel with front wall of building
  5. Install threshold transitions at locations indicated on Final Floor Finish Plan.
- H. Wipe down bleed through of adhesive, if specified, during installation.
- I. Rolling (Adhered Flooring): Set flooring into place, thoroughly cross roll with a 100-150 pound three-sectional roller before adhesive set time expires to attain full adhesion.
- J. Terminate flooring at centerline of door openings where adjacent floor finish is dissimilar. Where flooring continues through door opening, continue established pattern with no interruption.
- K. Install transition strips at unprotected or exposed edges where flooring terminates.
  1. Set metal transition strips butted to adjacent flooring. Anchor into concrete slab with specified fasteners. Drill concrete with Matched Tolerance Drill Bit for Dense Concrete by Hilti.
- L. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.
- M. Continue flooring under movable type partitions without interrupting floor pattern.

### 3.6 FIELD QUALITY CONTROL

- A. Inspect resilient flooring installation, pattern, layout, and attachment to substrate.
- B. Correct deficiencies in Work which inspection indicates are not in compliance with Contract Documents.

### 3.7 CLEANING

- A. Remove excess adhesive from floor, base, and wall surfaces without damage. Ensure all adhesive residues are removed from tile upon completion of each night's work.
- B. Broom clean resilient flooring after application.
- C. Dispose of construction waste in accordance with the requirements of Section 01351.

### 3.8 FLOOR TREATMENT

- A. Examine surfaces and adjacent areas where finishing products will be applied and verify that surfaces conform to product manufacturer's requirements for substrate conditions.
- B. Cleaning and Wax Finish of New Flooring is by Owner's PFC and is specified in Appendix A (Section 09650).
- C. Strip, Clean, and Wax of Existing Flooring: Provide Strip, Clean, and Wax treatment for VCT and PVC/LVT if shown or noted on the drawings to receive Strip, Clean, and Wax on existing to remain flooring. Strip, Clean, and Wax may be directed to remove damage and stain left after fixtures are relocated, or to restore a uniform sheen among piece replaced and existing tiles.
  - 1. Stripping:
    - a. Dry sweep dust and debris from floor.
    - b. Dilute and apply stripping product according to product manufacturer's recommendations. Strip floor using a propane powered auto scrubber fitted with a [3M Blue Cleaner Pad 5300](#).
    - c. Thoroughly rinse and mop or vacuum excess stripping product.
  - 2. Cleaning:
    - a. Dilute and apply cleaning product according to product manufacturer's recommendations.
    - b. Clean floor using a propane powered auto scrubber fitted with a [3M Blue Cleaner Pad 5300](#).
    - c. Thoroughly rise and mop or vacuum excess cleaning product.
  - 3. Wax Finishing:
    - a. Prepare finish material in accordance with manufacturer's recommendations.
    - b. Apply wax product and spread using a new mop head. Allow first coat of wax to dry thoroughly dry, a minimum of one hour before applying second coat of wax.
    - c. Using a clean or new mop head, apply second coat of wax.
    - d. Allow a minimum of 6 hours for wax material to cure before allowing customer traffic.

END OF SECTION

## SECTION 09655 - RESILIENT BASE AND ACCESSORIES

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes: Owner furnished resilient base and accessories, including the following, for installation by Contractor:
  - 1. Rubber or Vinyl Resilient Base (RB).
  - 2. ¼ in. Plastic Base (B).
  - 3. 3/8 in. or 5/8 in. Plastic Base (DB).
  - 4. Sanitary Cove Base (SCB).
  
- B. Related Requirements: The following list is intended to aid in locating products and work related to or dependent on the scope of this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
  - 1. Section 07900 – Joint Sealers: Sealant between bases and floor or wall surfaces.
  - 2. Appendix A – Products and Work by Owner or Separate Contractor: Manufacturers, suppliers, product information, and general procedures related to Owner furnished products.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
  
- B. ASTM International (ASTM):
  - 1. ASTM E 84 - Surface Burning Characteristics of Building Materials.
  - 2. ASTM F 710 – Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
  - 3. ASTM F 1861 – Resilient Wall Base.

## 1.3 DELIVERY, STORAGE AND HANDLING

- A. Receive Owner Furnished products in accordance with the requirements of Section 01600.
  - 1. Product Delivery: Owner's Supplier will deliver Owner furnished products to site to be received by Contractor. Contact Owner's Suppliers to coordinate delivery of Owner furnished products and materials.
  
- B. Transport, handle, store, and protect products in compliance with the requirements of Section 01600.

## PART 2 - PRODUCTS

## 2.1 OWNER FURNISHED PRODUCTS

- A. Owner's Supplier will furnish products in the scope of this Section as specified in Appendix A (Section 09655) for installation by Contractor.

## PART 3 - EXECUTION

## 3.1 INSTALLATION

- A. Resilient Base:
  - 1. Install base in accordance with manufacturer's requirements using manufacturer's approved adhesive.
  - 2. Fit joints tight and vertical. Maintain minimum measurement of 18 inches between joints.
  - 3. Install base on solid backing. Bond tight to wall surfaces.
  - 4. Use premolded corner units except as follows:
    - a. Field-form RB5 outside and inside corners. Do not use premolded end caps or corner units.

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5. Scribe to fit door frames and other interruptions.
6. Remove excess adhesive from floor, wall surfaces and base.

B. Plastic Base:

1. Fit joints tight and vertical. Maintain minimum measurement of 18 inches between joints
2. Install base on solid backing. Bond tight to wall and floor surfaces.
3. Scribe to fit door frames and other interruptions.
4. Miter and adhesively bond plastic base joints together.
5. Pre-drill plastic base and trim for attachment screws. Unless otherwise shown, attach plastic base at 24 inches on center into metal stud wall framing.

C. Sanitary Cove Base:

1. Install base in accordance with manufacturer's written instructions and as shown on the Drawings.

D. Building Tape: Install at base of wall or at joints as shown on the drawings. Install in accordance with manufacturer's instructions.

3.2 CLEANING

- A. Remove excess adhesive from floor, base, and wall surfaces without damage.

END OF SECTION

## SECTION 09656 (09 6516) – RECYCLED RUBBER COMMERCIAL SHEET FLOORING

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes: Recycled rubber sheet flooring, adhesive, and accessories furnished by Owner and installed by Owner through Owner's Preferred Flooring Contractor (PFC).
- B. Related Requirements: The following list is intended to aid in locating work related to or dependent on the scope of Work in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
  - 1. Section 01351 – Regulatory Compliance.
  - 2. Section 01600 - Product Requirements: Contractor's Product Selection Checklist.
  - 3. Section 03314 – Cast-In-Place Concrete Slabs (Interior): Substrate.
  - 4. Section 09650 - Resilient Flooring: Construction joint and subfloor filler.
  - 5. Appendix A - Products and Work by Owner or Separate Contractor. General procedures, manufacturers, suppliers, vendor contacts, and product names and numbers for Owner furnished products or services.

## 1.2 QUALITY ASSURANCE

- A. Owner's Preferred Flooring Contractor: The Owner's Preferred Flooring Contractor (PFC) is a firm hired by and contracted by the Owner for the purpose of executing installation work within the scope of this section. The PFC shall be one the following as determined by Owner:
  - 1. A&I Floor Covering: Contact Adam Difabrizio (801) 509-9587 or Israel Kingston (801) 509-9588.
  - 2. Jones Tile: Contact Donna Ray (573) 692-4033 or Clemet Jones (573) 836-0881.
  - 3. RMI: Contact D A Pope (229) 424-8411, Guntra Harper (229) 468-9822, or Keisha Davis (229) 425-8842.
  - 4. Robinett: Contact Gayla Robinett, (918) 253-1425.

## 1.3 DELIVERY, STORAGE, AND HANDLING

- A. Product Packaging: Rubber flooring and accessories will be packaged in manufacturer's standard cartons.
- B. Owner Furnished Product Delivery: Owner will deliver products for receipt by Contractor on delivery date established by Contractor.
- C. Acceptance at Site: Receive Preferred Flooring Contractor furnished flooring and accessories in accordance with the requirements of Section 01600.
- D. Storage:
  - 1. Provide one container for storage of flooring materials and equipment for use by the PFC in accordance with requirements specified in Section 01500.
  - 2. Store materials in a secure indoor area to prevent loss due to theft or damage. Protect from excessive cold, heat, temperature fluctuations, humidity, and moisture penetration.
  - 3. Store flooring on original pallets. Do not stack multiple pallets.
- E. Storage Conditions:
  - 1. Store flooring and adhesive in a controlled climate condition for 48 hours before installation, with temperature and humidity within range of not less than 60 degrees F or more than 75 degrees F.
  - 2. Do not allow adhesive to freeze.

## 1.4 REQUIREMENTS OF CONTRACTORS

- A. Preferred Flooring Contractor (PFC) shall be responsible for the following:

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1. Furnish installation materials and equipment.
2. Compliance with safety and badging requirements of Contractor.
3. Lead installer's attendance at morning communication meetings.
4. Tracking of material usage and ensuring quantities on hand are sufficient for Work.
5. Submission of Weekly Flooring Installation Report to Contractor and Owner's Construction Manager each Friday (as applicable for duration of work).
6. Submission of any required Flooring Add-on Order forms. Contact Owner's Construction Manager for required forms.
  - a. Expedited freight charges incurred by add-on orders are the responsibility of the Preferred Flooring Contractor.
7. Return to project Site 7-14 days prior to Grand Re-Opening for required corrections related to work specified herein.

B. General Contractor shall be responsible for the following:

1. Temporary electrical service for Preferred Flooring Contractor's equipment as described in Section 01500.
  - a. Contact the PFC for temporary electrical requirements of equipment prior to submission of Bid.
2. Disposal of waste generated by flooring activities including, but not limited to, opened adhesive containers.
3. Disconnection and reconnection electrical power to existing to remain equipment and fixtures, including registers, required to be moved for installation of flooring.
4. Attendance at Pre-Possession meeting at site and time determined by Owner's Construction Manager to assist in determination of flooring installation and finishing schedule (Phasing Plan).
5. Providing one container for storage of flooring and equipment for PFC's use. Storage container requirements are specified in Section 01500. Coordinate container provided for the work herein with containers to be provided for installation of resilient flooring materials specified in the scope of other Specifications Sections, if required.
6. Supervision of flooring scope of work, which includes, but is not limited to:
  - a. Flooring schedule Phasing Plan: Take lead role in developing the Phasing Plan with team (Owner's Construction Manager, Store Planning, and Preferred Flooring Contractor).
  - b. Ensuring Phasing Plan schedule is executed: Sequence of moves, daily flooring minimums, etc.
  - c. Ensuring conformance with the plans and specs.
7. Identification of compromises in Owner's PFC's performance, if any, and communicating concerns to Owner's Construction Manager.
8. Coordination of product delivery schedule with Owner's PFC.
9. Submission of Flooring Return Request form to Supplier and ensuring receipt of required Return Authorization Documents.

## PART 2 - PRODUCTS

### 2.1 OWNER FURNISHED PRODUCTS

- A. Owner will furnish to the Owner's PFC and Owner will install through its PFC the following, as specified in Appendix A (Section 09656):
1. Recycled Rubber Resilient Flooring.
  2. Adhesive.
  3. Transition Strip.
  4. Trowelable Leveling and Patching Compounds.

### 2.2 PROTECTION BY CONTRACTOR

- A. Maintain room temperature as near as possible to 65 degrees F for 12 hours after installation.
- B. Protect installation from foot traffic, shopping carts, and motorized mobility scooters for a period of 3 hours.
- C. Protect installation from loaded rolling pallet traffic for a period of 24 hours.
- D. Cover storefront and automatic sliding glass doors where direct sunlight accelerates room temperature above 80 degrees F for 72 hours after installation

- E. Protect flooring from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period. Use protection methods and materials recommended in writing by manufacturer.

END OF SECTION



## SECTION 09680 - CARPET

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Owner furnished Carpet Tiles and transitions for installation by Contractor.
- B. Related Requirements: The following list of items is intended to aid in locating products and work related to or dependent on the scope in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
  - 1. Section 13030 – Modular Building Components: Carpet tile, primer, and transition strips when part of a modular pharmacy project.
  - 2. Appendix A – Products and Work by Owner or Separate Contractor: Owner furnished products, manufacturers, suppliers, and vendor information related to Owner furnished products and work.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. Carpet and Rug Institute (CRI):
  - 1. CRI 104 - Standard for Installation of Commercial Carpet.

## 1.3 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who is certified by the Floor Covering Installation Board or who can demonstrate compliance with its certification program requirements.

## 1.4 DELIVERY, STORAGE AND HANDLING

- A. Product Packaging: Carpet will be shipped in cartons. Manufacturer's published installation instructions will be included in package.
- B. Receive Owner Furnished products in accordance with the requirements of Section 01600.
  - 1. Product Delivery: Owner's Supplier will deliver Owner furnished products to site to be received by Contractor. Contact Owner's Suppliers to coordinate delivery of Owner furnished products and materials.
- C. Comply with CRI 104, Section 5, "Storage and Handling."
- D. Transport, handle, store, and protect products in compliance with the requirements of Section 01600 and manufacturer's recommendations.
- E. Protect packaged adhesive from temperature cycling and cold temperatures. Keep adhesives away from any ignition source.

## 1.5 SITE CONDITIONS

- A. Maintain areas to receive carpet at constant minimum temperature of 45 to 50 degrees F for minimum three days prior to and during installation.

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1. Comply with carpet manufacturer's surface moisture requirements.
2. Provide negative alkalinity at substrate.

B. Provide continuous ventilation during and after installation.

C. Do not install carpet until wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

D. Provide lighting levels of 80 foot candles measured mid-height at substrate surface.

E. General: Comply with CRI 104, Section 6.1, "Site Conditions; Temperature and Humidity."

F. Do not install adhesive applied carpet over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by manufacturer.

## 1.6 SCHEDULING

A. Schedule installation to prevent damage to carpet by subsequent construction activities.

## PART 2 - PRODUCTS

### 2.1 OWNER FURNISHED PRODUCTS

A. Owner will furnish carpet products and accessories as specified in Appendix A (Section 09680) for installation by Contractor.

### 2.2 MATERIALS BY CONTRACTOR

A. Subfloor Filler (Cementitious Based Underlayment): Provide Schonox SL, by HPS North America, Inc. (256) 246-0345.

B. Contraction/Construction Joint Filler: Provide MasterSeal CR 190 (formerly Epolith P) two-part, 100% solids, flexible epoxy joint filler by Master Builders Solutions (800) 433-9517 or (800) 243-6739 (technical service)

## PART 3 - EXECUTION

### 3.1 EXAMINATION

A. Examine surfaces and adjacent areas where products will be installed and verify that surfaces conform to product manufacturer's requirements for substrate conditions. Do not proceed until unsatisfactory conditions have been corrected.

1. Substrate Surface: Clean, true, and free of irregularities.

B. Beginning of installation indicates acceptance of substrate conditions.

### 3.2 PREPARATION

A. Prepare substrate for product installation in accordance with manufacturer's published instructions.

B. Properly prepare and fill contraction and construction joints under carpeting with cementitious based underlayment subfloor filler or epoxy subfloor filler as specified in Part 2 above.

C. Vacuum clean surfaces free of loose particles.

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### 3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Comply with CRI 104, Section as applicable for the application method used.
- C. Install transition strips at perimeter or at locations shown on Drawings.

### 3.4 FIELD QUALITY CONTROL

- A. Inspect installation, pattern matching, and attachment to substrate.
- B. Correct deficiencies in Work which inspection indicates are not in compliance with Contract Documents.

### 3.5 CLEANING AND PROTECTION

- A. Perform the following operations immediately after installing carpet:
  - 1. Remove excess adhesive, seam sealer, and other surface blemishes using cleaner recommended by carpet manufacturer.
  - 2. Remove yarns that protrude from carpet surface.
  - 3. Vacuum carpet using commercial machine with face-beater element.
- B. Protect installed carpet to comply with CRI 104, Section 15 "Protection of Indoor Installations."
- C. Protect carpet against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet manufacturer.

END OF SECTION

## SECTION 09720 (09 70 20) –DECORATIVE FAUX TILE WALL PANELS

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Owner furnished interior tile-look wall panels and accessories for installation by Contractor.
- B. Related Requirements: The following list of items is intended to aid in locating products and work related to or dependent on the scope in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
  - 1. Section 06610 – Glass Fiber Reinforced Plastic: FRP panels, characteristics, and installation.
  - 2. Section 09250 – Gypsum Board: Gypsum board and glass-mat backer board substrates.
  - 3. Section 09900 – Paint and Coatings: Coatings and preparation for gypsum wallboard receiving paint.
  - 4. Appendix A – Products and Work by Owner or Separate Contractor: Manufacturers, suppliers, product information, installation (if applicable), and general procedures related to Owner furnished products.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. ASTM International (ASTM):
  - 1. ASTM E 84 - Test Method for Surface Burning Characteristics of Building Materials.
  - 2. ASTM D 256 - Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics.
  - 3. ASTM D 638 - Test Method for Tensile Properties of Plastics.
  - 4. ASTM D 790 - Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.

## 1.3 QUALITY ASSURANCE

- A. Installer qualifications: Not less than 3 years' experience in installation of similar system.
- B. Fire Performance Requirements:
  - 1. Surface Burning Characteristics: Conform to the following in accordance with ASTM E 84.
    - a. Flame Spread: Less than 25 or less.
    - b. Smoke Density: 450 or less.

## 1.4 DELIVERY, STORAGE AND HANDLING

- A. Transport, handle, store, and protect products in compliance with the requirements of Section 01600.
- B. Receive Owner Furnished products in accordance with the requirements of Section 01600.
  - 1. Product Delivery: Owner's Supplier will deliver Owner furnished products to site to be received by Contractor. Contact Owner's Suppliers to coordinate delivery of Owner furnished products and materials.
- C. Store in clean, dry, enclosed, and secure storage area. Store flat on supplier's original shipping pallets and in accordance with manufacturer's published requirements.
- D. Protect adhesive from freezing temperatures, excessive heat, temperature fluctuations, humidity and moisture penetration.

## 1.5 PROJECT CONDITIONS

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- A. Enclose and weatherproof installation areas prior to beginning installation.
- B. Maintain panel and adhesive material in an environment of a minimum of 68 F and within humidity range recommended by panel manufacturer for at least 24 hours prior to beginning the installation.

## PART 2 - PRODUCTS

### 2.1 OWNER FURNISHED PRODUCTS

- A. Owner's Supplier will furnish decorative wall panels as specified in Appendix A (Section 09720) for installation by Contractor.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Examine surfaces and adjacent areas where products will be installed. Verify that substrates are of type approved by manufacturers of adhesive and panels.

### 3.2 APPLICATION OF ADHESIVE

- A. Prepare wall substrate free of joint compound, dust, oil, grease, and other contaminants inhibiting adhesion. Patch holes and depressions. Remove high spots and flanges.
  - 1. Dust Removal: Damp-wipe surfaces to prepare a dust-free surface. Sand joint compound and apply a latex-based primer over joint compounds if dust release continues.
  - 2. Grease Removal: Prepare a solution of 1 tsp Dawn dish soap with 32 oz (1 qt) water and apply to substrate. Rinse thoroughly and allow to dry before applying spray adhesive.
- B. Troweling Method: V-notch trowel 3/16-in. wide x 1/4-in deep, spaced 11/16-in. on center.
- C. If wall substrate is not straight or if installing over glossy or non-porous wall substrate, adhere to adhesive manufacturer's written recommendations for blocking or bracing.
- D. Clean adhesive immediately. Do not allow run-off adhesive to cure.

### 3.3 PANEL INSTALLATION

- A. Composite Vinyl Faux Tile Panel (HangLock): Install panels in accordance with manufacturer's written instructions and the following:
  - 1. Verify wall surface is dust-free.
  - 2. When installing over existing FRP or ceramic tile, prepare existing surface flush as follows:
    - a. To prepare an FRP surface, cut out transition strips, trim, and around any bubbles in existing wall panels. Fill joints and gaps with quick-set drywall mud and let dry thoroughly before beginning faux tile panel installation.
    - b. To prepare a ceramic tile surface, remove damaged tiles and infill with quick-set drywall mud. Existing grout joints need not be filled.
  - 3. Mark vertical, horizontal, and corner lines along entire wall receiving panel.
  - 4. Corner Installation:
    - a. Preformed Mitered Corners: Begin installation with manufacturer's preformed mitered corner piece in one inside corner at the base of the wall. Adjoin flat panels to the preformed mitered corner piece and continue flat panels to the end of the wall.
    - b. Straight Starter Corners: For any other inside corners receiving panels, cut panels straight and flush into corner to create a straight start. Use a box knife or tin snips for cutting the panels.
  - 5. Install second and subsequent rows of panels if height shown on drawings requires. Install second row and subsequent rows of panels by adhering the base of panel first.
  - 6. Install around door frames, cut-outs, and to ceiling.

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- B. FRP Faux Tile Panel (Marlite): Install panels in accordance with manufacturer's written instructions and the following.
1. Prefit each wall panel before securing in place. Cut panels with carbide-tipped power saw or swivel-head shear.
  2. Provide panel manufacturer's recommended spacing between abutting panel ends, edges and trim. Provide minimum 1/8 inch space around pipes, electrical fittings, obstructions and other items penetrating panels. Fill joints with sealant.
  3. Install panels with edges vertical and plumb. Use maximum length pieces to provide minimum number of end joints.
    - a. Align panel to panel vertical joints at inside and outside corner conditions.
  4. Install accessory panel trim pieces concurrently with installation of panels. Miter cut accessory panel trim at corners to provide smooth transition. Set trim attached to adjacent panel ends and edges and seal with sealant.
  5. Seal corner seams, base and ceiling junctures, and junctures between panels and wall with sealant.
  6. Provide sealant around all openings, corners, and joints.
- C. Trim:
1. Bottom of Panel Trim: Install trim to cover bottom of panel only if new base will not be installed.
  2. Top of Panel Trim: Install top trim at all panel locations.
  3. Standard Outside Corner Trim: Install outside corner trim using countersunk or flathead screws at all panel locations unless noted otherwise.
  4. High Impact Outside Corner Trim: Install where shown on Drawings.
- D. Sealant:
1. Seal inside corner if corner includes a cut seam.
  2. Seal vertical seams along interlocking teeth where long tooth of one panel meets short tile of adjoining panel. Seal horizontal seam along top of panels if panel height shown on drawings requires additional panels.
  3. Remove excess sealant during installation.

END OF SECTION

## SECTION 09777 – VINYL GRAPHIC FILM WRAP

## PART 1 - GENERAL

## 1.1 SUMMARY

## A. Section Includes:

1. Owner furnished, Contractor installed vinyl graphic film wrap used for color or design rebranding of various substrates.
2. Owner furnished “Emergency Exit” vinyl graphic decals for installation by Contractor.

## B. Related Requirements:

1. Section 09900 – Paints and Coatings: Field painting of canopy columns, components, and other miscellaneous supporting steel sign structures as shown on Drawings when color rebranding is included in project.
2. Section 10736 – Metal Canopy: Canopy rebranding with vinyl film.
3. Appendix A - Products and Work by Owner or Separate Contractor: Manufacturers, suppliers, performance, and general procedures related to Owner furnished products:
  - a. Contact for Owner furnished graphic film, procurement as managed by Vinyl Wrap Contractor.

## 1.2 DELIVERY, STORAGE, AND HANDLING

- A. Product Delivery: Deliver vinyl film to site on or near the day scheduled for wrap installation.
- B. If required to receive or store vinyl film and equipment prior to scheduled installation, comply with the requirements of Section 01600 and vinyl graphic film manufacturer’s recommendations.

## 1.3 SEQUENCING, SCHEDULING, AND COORDINATION

- A. Immediately after Award of Contract, Contact the preselected Vinyl Wrap Contractor to coordinate installation schedules. Preselected Vinyl Wrap Contractor is as follows:

1. Clampitt Companies, LLC, Springfield, MO. Contact Randy Ralph, (479) 866-6900, [rralph@clampitt.com](mailto:rralph@clampitt.com).

## PART 2 - PRODUCTS

## 2.1 OWNER FURNISHED PRODUCTS

- A. Owner will furnish vinyl graphic film through its supplier, whose contact is as specified in Part 1 of Appendix A.

## 2.2 CANOPY REPLACEMENT CONDITIONS

- A. For projects requiring replacement of canopy fascia panels or other canopy components where determined by Vinyl Wrap Contractor to be unsuitable for wrapping (not typical), contact the following:

1. Arning Companies, Inc., Cassville, MO; Contact Gavin Chapman, (800) 732-5074, [gchapman@arningco.com](mailto:gchapman@arningco.com).

## PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Verify dimensions and condition of substrate to be wrapped in accordance with Vinyl Wrap Contractor’s requirements.

## 3.2 PREPARATION

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- A. Prepare substrate in accordance with [Graphic Film Manufacturer's written recommendations](#).
- B. Prepare substrates to a relatively clean, dry, non-porous, and smooth condition.
- C. Fill and patch holes left by existing penetrations ½-inch in diameter or smaller; for larger holes and other substrate compromises, contact Vinyl Wrap Contractor to determine additional preparation requirements.

### 3.3 INSTALLATION

- A. Install film wrap at locations shown on Drawings in accordance with manufacturer's recommendations.
- B. Vinyl "Emergency Exit" Glazing Decals: Install "Emergency Exit/Do Not Enter" decals in accordance with manufacturer's recommendations on Pickup surface mounted automatic sliding door glazing where shown.

END OF SECTION



## SECTION 09900 - PAINTS AND COATINGS

## PART 1 - GENERAL

## 1.1 SUMMARY

## A. Section Includes:

1. Field applied paints and finishes for interior and exterior surfaces.
2. Repair and surface preparation of existing surfaces.
3. Application of new coatings.

## B. Related Requirements: The following list is intended to aid in locating products and work related to or dependent on the scope in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.

1. Section 01351 – Regulatory Compliance.
2. Section 04200 – Unit Masonry Assemblies: Water repellent admixtures for integrally colored CMU or architectural masonry CMU.
3. Section 04910 – Masonry Restoration and Repair: Repair and surface contaminant removal for existing, damaged, or defective CMU, brick, or precast sills and caps.
4. Section 06173 (Non-Proto) – Heavy Timber Wood Trusses: Selection of wood stains.
5. Section 07243 – Drainable Exterior Insulation and Finish System (EIFS): For cross-referencing integral EIFS colors to color designations in the Exterior Color Schedule herein.
6. Section 07900 - Joint Sealers: Filler and sealant for crack repair.

## 1.2 REFERENCES

## A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.

## B. ASTM International (ASTM):

1. ASTM C 90 - Loadbearing Concrete Masonry Units.
2. ASTM C 1324 – Standard Test Method for Examination and Analysis of Hardened Masonry Mortar.
3. ASTM D 1653 – Standard Test Methods for Water Vapor Transmission of Organic Coating Films (Wet Cup Method).
4. ASTM D 2244 – Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates.
5. ASTM D 2370 – Standard Test Method for Tensile Properties of Organic Coatings.
6. ASTM D 3273 – Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings.
7. ASTM D 3359 – Measuring Adhesion by Tape Test.
8. ASTM D 4214 – Evaluating the Degree of Chalking of Exterior Paint Films per Method A Cloth Tape Method
9. ASTM D 4262 – Test Method for pH of Chemically Cleaned or Etched Concrete Surfaces.
10. ASTM D 4263 - Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
11. ASTM D 6677 – Test Method for Evaluating Adhesion by Knife.
12. ASTM D 6904 – Resistance to Wind-Driven Rain.
13. ASTM E 514 – Water Leakage of Masonry.

## C. Occupational Safety and Health Administration (OSHA):

1. OSHA 01926.1153 Respirable Crystalline Silica.

## D. The Society for Protective Coatings (SSPC):

1. SSPC-SP1 – Solvent Cleaning.
2. SSPC-SP3 – Power Tool Cleaning.
3. SSPC-SP15 - Commercial Grade Power Tool Cleaning.

## 1.3 DEFINITIONS

- A. Owner's Inspection Representative or Owner's Authorized Representative: Performs prior-to-bid inspection of store site; completes and disseminates inspection report for interpretation into project documents.
- B. Cleaning: Surface preparation required to provide a surface suitable to apply surface coatings. Includes pressure washing, application of cleaning agents, and other methods as described in Part 3 herein.
- C. Loose Coatings: Visible chipping, blistering, flaking, peeling, or flags in existing surface coatings.
- D. Loose Coating Removal (LCR): Refers to targeted or isolated removal of visibly Loose Coatings by one or more select methods specified in Part 3 herein, in areas identified on Drawings.
- E. Partial Coating Removal: Refers to pervasive Loose Coating Removal practices for remediation of large areas and requiring pressure washing as specified in Part 3 herein as a minimum requirement, in areas shown on Drawings. Partial Coating Removal is directed for the following conditions:
  - 1. Where test results reveal broad adhesion problems. In this case, Loose Coating may or may not be visible within the area of suspected poor adhesion.
  - 2. Where a high frequency of visible Loose Coating manifesting within a painted area gives assumption of broad adhesion problems.
- F. Substrates Receiving Loose Coating Removal and Partial Coating Removal:
  - 1. CMU, concrete, and metal substrates, by a combination of the power washing and hand tool methods specified in Part 3 herein.
  - 2. Not applicable for composite applied surfaces such as EIFS and stucco.
- G. Total Coating Removal (TCR): Refers to removal of all layers of coatings as specified in Part 3 herein.

#### 1.4 ENVIRONMENTAL REQUIREMENTS

- A. If work area is enclosed, use fire retardant enclosure materials and indirect-fired heating equipment ventilated outside of the enclosure.
- B. Waste Management:
  - 1. Store, transport, and dispose of waste in accordance with local, state, and federal regulations and the regulatory documents referenced in Section 01351.
  - 2. Do not dispose of paint, containment materials, or project waste in Owner's dumpsters.
  - 3. Do not allow dry materials to enter storm drain inlets.
  - 4. Clear debris and waste from the site daily.
  - 5. Use HEPA-rated filter vacuum to clean surfaces of dirt, dust, and debris.
  - 6. Obtain paint in containers of the largest size practical for each color, sheen, and type.
  - 7. Furnish disposal containers.
  - 8. Clean and recycle any and all coatings containers according to manufacturer's and Owner's recommended recycling process.
- C. Wastewater Management:
  - 1. Collect wash wastewater and store, transport, manifest and dispose of according to local, state, and federal regulations and the regulatory documents referenced in Section 01351. Consult local wastewater treatment operator for direction.
  - 2. Do not allow wash wastewater to flow from the surface cleaning processes to a storm water drain or catch basin, street, roadway, sidewalk, gutter, landscape area, or any type of storm water structure.
- D. Dust Suppression and Containment:
  - 1. Contain fugitive dust and debris from contaminating surrounding property. Protect customers and associates from airborne dust and abrasive media by establishing dust containment and safety zones with caution tape or barricades prior to beginning to isolate work in areas of store operations.
  - 2. Minimize dust emissions and provide equipment that suppresses dust. Where scraping, chiseling, sanding, or grinding of concrete or masonry surfaces is required, use proper dust control tools and methods to maintain dust emissions below permissible levels as defined by federal, state, and local AHJ.

## 1.5 PROJECT CONDITIONS

- A. Maintain minimum surface temperatures or ambient air temperature as follows for the specified coatings unless otherwise recommended by the manufacturer or specified in the Paint Schedule herein:
  - 1. Alkyd, epoxy, polyurethane, and interior and exterior acrylic and latex finishes: 50 degrees F.
  - 2. Varnish and transparent finishes: 65 degrees F.
  - 3. All coatings: Surface temperature at least 5 degrees F above the dew point.
- B. Monitor surface temperatures, ambient air temperatures, and relative humidity. Maintain maximum surface temperatures or ambient air temperatures and relative humidity as recommended by the manufacturer. Do not proceed with coatings application until unsatisfactory ambient and surface conditions have been corrected.
- C. If ambient temperatures are not within coating manufacturer's recommended tolerances, provide continuous ventilation and heating facilities to maintain temperatures above the minimum surface and air temperature specified above for 24 hours prior to, during, and 48 hours after application of finishes.
- D. Perform painting under lighting conditions of not less than 80 foot candles measured mid-height of the painter at substrate surface. Where artificial lighting is required, provide explosion-proof artificial lighting.

## 1.6 ADMINISTRATIVE REQUIREMENTS

- A. Store Management Coordination:
  - 1. Schedule a conference call with the Store Manager a minimum of two weeks in advance of commencement of work. Communicate daily the sequence of work with Store Management.
  - 2. Schedule operations to avoid interference with store operations and during times agreeable to store management.
  - 3. Coordinate moving of merchandise and fixtures with Store Manager prior to painting in Sales areas.
- B. Do not schedule surface preparation and other dust generating work near areas which have wet, newly coated surfaces.
- C. Do not schedule paint work when rain, snow, fog, or mist are present or forecasted to be present within 24 hours of beginning paint application.
- D. Scheduling for Owner's independent and Manufacturer's Representative inspections is specified in Part 3 herein.
- E. Verify manufacturers' national accounts purchase order procedure in order to ensure timeliness of delivery and accuracy of products.

## 1.7 SUBMITTALS

- A. Closeout Documents: Submit closeout documents in accordance with the procedures established in Section 01770.
- B. Exterior Paint Contract Verification and Documentation: Provide copy of executed Contract and Contract Completion/Release between General Contractor and Exterior Coatings Contractor, together with executed copies of in-progress Contract amendments, addendums, and Change Order directives.
  - 1. Contract closeout shall not be complete without verification that exterior paint work was contracted, performed, and completed by an Approved Exterior Coatings Contractor.
- C. Reports and Warranties:
  - 1. Pre-Installation Conference Report including minutes, attendees, and agenda items with action and resolution notes.
  - 2. Manufacturer's Extended Material Performance Warranty.
  - 3. Contractor's Labor and Workmanship Warranty.
  - 4. Owner's Independent Inspector commentary and report, including documentation of any Contractor remediation of noted deficiencies.
  - 5. Coating Manufacturer's Representative commentary and report, including documentation of any Contractor remediation of noted deficiencies.

6. Notations taken from Coating Manufacturer's post-installation site visit as specified hereinafter, including date of visit and contact information of inspector.
  7. Contractor's Completion Report including Observation Logs, documentation of all items described in Contractor's In-Progress Inspections in Part 3 herein, and Photographic Documentation as described in this Article.
- D. In-Progress Observation and Photographic Documentation: Including comments and at least 10 wide-angle photos taken at each work stage, including but not limited to the following:
1. Before start of project.
  2. During removal and replacement of sealants as specified in Part 3 herein.
  3. Masonry repairs such as random cracks, mortar joints, holes, and divots.
  4. During surface preparation of concrete and metal as specified in Part 3 herein.
  5. During application of each coat, including spray and back roll application, as specified in Part 3 herein.
  6. After completion of project.
  7. Observations and photos of each elevation from the same location in each work stage.
  8. Construction Progress Log, Observation Log, and other Contractor maintained workday log.

## 1.8 QUALITY ASSURANCE

- A. Regulatory Requirements:
1. VOC Content: Provide paint and coating materials that conform to Federal, State, and Local restrictions for Volatile Organic Compounds (VOC) content.
  2. Toxicity/EQ: Comply with federal, state, and local toxicity and environmental quality regulations and with federal requirements on content of lead, mercury, and other heavy metals. Do not use solvents in paint products that contribute to air pollution.
- B. Exterior Wall Pre-Installation Conference: Including conference methods such as on site diagnostic walking and any other on site documented meeting, with observations, occurring in advance of the bid or after Award of contract for exterior wall work.
1. Plan and Convene a pre-installation conference to take place at the site one week prior to commencing Work of this Section. Confirm scheduling of conference with Owner's Construction Manager and Owner's Project Manager.
  2. At least two weeks in advance of the meeting, confirm scheduled time with all attendees. Make available the meeting agenda at the time of confirmation.
  3. Meeting Minutes:
    - a. Record minutes of meeting including discussions, decisions and agreements reached, and attendance roster.
    - b. Obtain signatures of all attendees.
    - c. Furnish a copy to each party attending and to Owner's representatives.
  4. Attendance:
    - a. Owner's Construction Manager.
    - b. Owner's Project Manager or other Owner's authorized representative.
    - c. Contractor.
    - d. Approved Exterior Coatings Contractor (coatings subcontractor).
    - e. Coating manufacturer's representative.
  5. Agenda:
    - a. Substrate conditions, pre-installation testing results, and specified preparation requirements.
    - b. Substrate preparation and repair details shown on drawings.
    - c. Sequence and method of application of coating systems.
    - d. Verify during the Pre-Installation Conference that Manufacturer's Representative concurs with the proposed overcoating systems after pre-installation tests are reviewed.
    - e. Review of Coatings Systems Schedule, including Contractor's choice of exterior coatings systems where multiple manufacturers are listed as comparable.
    - f. Review of Contractor's required photo documentation as specified herein.
    - g. Scope of coating manufacturer's observations and reports.
    - h. Coating manufacturer's performance warranty provisions.
    - i. Workmanship warranty conditions.
  6. Prepare Pre-Installation Conference Report and submit as a Closeout Submittal as specified herein.

- C. Owner's Independent Inspections: An inspection firm will be contracted and paid for by the Owner and included in the project for exterior coatings assessments and testing. The Owner's Inspection Representative is as follows:
1. Flagsin Group, LLC. La Plata, MD. Contact Ops@Flagsingroup.com.
  2. Observations and inspections performed by the Owner's Independent Inspectors is separate from and does not relieve Contractor's responsibility for conformance with the Contract Documents.
- D. Coating Manufacturer's Representative: Maintain communications with a Manufacturer's Representative who is qualified to provide site observations and recommendations. Upon completion of the painting, ensure that the Manufacturer's Representative provides recommendations for correction of any noted deficiency.
1. Contractor's requirements for coordinating Manufacturer's Representative visits are specified in Part 3 herein.
- E. Exterior Wall Coating Field Sample:
1. Prepare sample panels by applying exterior wall coating system 5 ft, 4 inches wide on full height of the wall at locations on the building shown on the drawings or established in the pre-installation meeting. Apply coating after the specified preparation and cleaning are completed.
  2. Where more than one substrate preparation is recommended in a pre-installation assessment or shown on drawings, prepare sample panels using the coatings systems specified for each substrate condition.
  3. If more than one texture masonry unit is used, center sample panel on control joint where transition occurs between dissimilar units.
  4. Apply coatings in accordance with manufacturer's recommendations and specified colors, texture, workmanship, and application requirements.
  5. Obtain approval of sample panel from the Owner's PM or other Authorized Inspection Representative.
  6. Maintain approved sample panel during construction as a reference for quality of completed Work. Do not alter, move, or destroy panel until Work is completed.
  7. Apply the final coat to the sample panel simultaneously with the application of the final coat to adjacent wall surfaces, resulting in the sample panel receiving one additional final coat.
- F. Exterior Wall Coating Applicator Qualifications:
1. Exterior Coatings Contractor shall be solely responsible for the construction means, methods, techniques, sequences, and procedures for completing the Work within the scope of this Section, and shall be experienced in the preparation of surfaces and application of protective coatings to the interior and exterior surfaces described herein.
  2. Approved Exterior Coatings Contractors: Select from among the following list of coatings contractors accredited and approved by the Owner. Do not contract with an exterior coatings contractor not listed herein unless expressly authorized, in writing, by Owner's Representative.
  3. Approved Coatings Contractors listed herein are assumed to accept both Facilities Services and Remodel work unless indicated otherwise.

Company Name	Contact	Email	Phone
ACS Construction	Gino Dellacava	<a href="mailto:Gino@acsconstructioninc.com">Gino@acsconstructioninc.com</a>	407-628-5552
Alatse Construction*	Jorge Estala	<a href="mailto:alatsedrywall@yahoo.com">alatsedrywall@yahoo.com</a>	210-875-5989
Alff Construction			402-677-7535
American Brushworks LLC	Frank Persson	<a href="mailto:fperssonjr@gmail.com">fperssonjr@gmail.com</a>	321-426-6290
Anthony Ogeerally Painting, Inc*	Andre Ogeerally	<a href="mailto:aogeerally@yahoo.com">aogeerally@yahoo.com</a>	407-342-4980
Apex Commercial Painting Inc	John Kowalski	<a href="mailto:john@apexcommercialpainting.com">john@apexcommercialpainting.com</a>	800-480-2062
Apex Imaging Services	Hal Hargrave	<a href="mailto:hhargrave@apeximagingervices.com">hhargrave@apeximagingervices.com</a>	909-215-2811
Applewood Enterprises, Inc*	Len Traber	<a href="mailto:ltraber@applewoodenterprises.com">ltraber@applewoodenterprises.com</a>	215-499-4075
Arch Painting Inc.	Chad Trial	<a href="mailto:ctrial@archpainting.com">ctrial@archpainting.com</a>	508-380-8792
Arteaga Painting	Eduardo Arteaga	<a href="mailto:arteagapaintingnc@gmail.com">arteagapaintingnc@gmail.com</a>	919-441-4137
Ascher Brothers	Rick Regal	<a href="mailto:rickyregal@ascherbrothers.com">rickyregal@ascherbrothers.com</a>	
Austin Jones	Amanda Franco	<a href="mailto:amanda@austinjonescorp.com">amanda@austinjonescorp.com</a>	562-916-5516
Brandpoint Services LLC	Gary Patterson	<a href="mailto:Gpatterson@Brandpointservices.Com">Gpatterson@Brandpointservices.Com</a>	865-599-2879
Brothers Colors Painting*	Conner Muwalski	<a href="mailto:connor@brotherscolorspainting.com">connor@brotherscolorspainting.com</a>	
C&K Paving**	Pual Smith	<a href="mailto:paul@ckpaving.com">paul@ckpaving.com</a>	724-705-3339
C&Ls Legacy Group LLC	Linda Christopher	<a href="mailto:LKChristopher@LCLLegacy.com">LKChristopher@LCLLegacy.com</a>	972-400-8839

Capitol Custom Carpentry, LLC	Kelly DeLaCruz	<a href="mailto:Kelldelela2@gmail.com">Kelldelela2@gmail.com</a>	919-710-9284
Carrillo's Painting	Carlos Carrillo	<a href="mailto:c_carrillo75@yahoo.com">c_carrillo75@yahoo.com</a>	580-603-1197
Charlotte Paint Co LLC*	Richard HO	<a href="mailto:Richard.ho@charlottepaint.com">Richard.ho@charlottepaint.com</a> ; <a href="mailto:bids@charlottepaint.com">bids@charlottepaint.com</a> ; <a href="mailto:brie.thompson@charlottepaint.com">brie.thompson@charlottepaint.com</a>	980-253-2291
Chosen Industries LLC*	Jane Shin, Olga Alcaraz	<a href="mailto:cfpaintings@hotmail.com">cfpaintings@hotmail.com</a>	(813) 808-033, (917) 659-1382
Christian Faith Painting Services LLC*	Reinaldo Sanhueza	<a href="mailto:james@cspave.com">james@cspave.com</a>	407-405-5732
Construction Services	James Cherry	<a href="mailto:james@cspave.com">james@cspave.com</a>	423-299-9690
Cosgrove Construction Inc	Bob Martino	<a href="mailto:bmartino@cosgroveconstructioninc.com">bmartino@cosgroveconstructioninc.com</a>	815-774-0036
CRVD Property Maintenance LLC*	Lori Conte or Elmer Willey	<a href="mailto:crvdllc@gmail.com">crvdllc@gmail.com</a>	267-596-8850
CTX Construction Systems Inc.*	Hector Canales	<a href="mailto:hector@ctxcontractors.com">hector@ctxcontractors.com</a>	832-707-0675
DEVACO (Reactive Work Only)	Sean Hogan	<a href="mailto:Sean.Hogan@davaco.com">Sean.Hogan@davaco.com</a>	
Devco Painting and Decorating	Jassen Jacobs	<a href="mailto:devcojassen@gmail.com">devcojassen@gmail.com</a>	702-834-0043
Diversify Construction & Painting LLC	Jaime Ramirez	<a href="mailto:diversifyconstructionpainting@gmail.com">diversifyconstructionpainting@gmail.com</a>	404-754-4992
DMG of the Carolinas	Jack C Payne	<a href="mailto:jpayne@Dmgstructuressc.com">jpayne@Dmgstructuressc.com</a>	864-332-7181
Divisions Maintenance Group	James Jones	<a href="mailto:james.jones@divisionsinc.com">james.jones@divisionsinc.com</a>	417-560-0287
Dynamic Contractors	Oscar Ulloa-Salgado	<a href="mailto:oscar@dynamiccontractorsus.com">oscar@dynamiccontractorsus.com</a>	336-437-6304
Eastern Commercial Coatings LLC	Stephen Hundley	<a href="mailto:shundley@easterncommercialcoatingsllc.com">shundley@easterncommercialcoatingsllc.com</a>	336-514-5406
Eastern Iowa Painting*	Greg Reininga	<a href="mailto:greg_reininga@certapro.com">greg_reininga@certapro.com</a>	319-521-3191
Elite Precision Construction LLC*	Cameron Ross	<a href="mailto:Eliteprecisionconstructionllc@gmail.com">Eliteprecisionconstructionllc@gmail.com</a>	317.491.8831
Facile Contractors LLC	Lidia Morales	<a href="mailto:facilecontractors.lm@gmail.com">facilecontractors.lm@gmail.com</a>	
Ferraro's Painting*	Frank Butler	<a href="mailto:fbutler@ferrarospainting.com">fbutler@ferrarospainting.com</a>	(203) 906-3007
Final Coat Painting	Jeff Balik	<a href="mailto:jbalik@fcpservices.com">jbalik@fcpservices.com</a>	
Finnish Coating Painting DBA	Glenn Johnson	<a href="mailto:glennj@finnishcoat.com">glennj@finnishcoat.com</a>	906-369-2886
Five Star Decorating	Anthony Neuman	<a href="mailto:an@fivestardecorating.com">an@fivestardecorating.com</a>	630-458-4477 x103
Fokis Building Services	Gianna Neumann	<a href="mailto:gn@fokis.net">gn@fokis.net</a>	317-417-2262
Forjak	Katie Hedges	<a href="mailto:khedges@forjakindustrial.com">khedges@forjakindustrial.com</a>	740-207-6920
Fresh Blast	Tim Graham	<a href="mailto:tim.graham@freshblast.com">tim.graham@freshblast.com</a>	651-447-2218
Gaels Painting*	Claudia Olacio	<a href="mailto:claudiaolacio@gaelspaint.com">claudiaolacio@gaelspaint.com</a>	405-413-6991
Genesis Painting & Decorating Co.	Jaime Contreras	<a href="mailto:jc@genesispaintingco.com">jc@genesispaintingco.com</a>	224-290-3640
Grabow Painting	Jeremy Grabow	<a href="mailto:jgrabow1@hotmail.com">jgrabow1@hotmail.com</a>	651-341-0570
Graydaze Contracting, Inc.	Mike Ewing	<a href="mailto:mewing@graydaze.com">mewing@graydaze.com</a>	404-388-3486
Harrison Contracting	Rachel Walls	<a href="mailto:rwalls@harrisoncontracting.com">rwalls@harrisoncontracting.com</a>	770-949-5776
Hayward Carpentry	Robin Hayward	<a href="mailto:robin@haywardcarpentry.com">robin@haywardcarpentry.com</a>	830-456-4746
Heartland Painting	Chisom Hossle	<a href="mailto:heartlandpainting18@yahoo.com">heartlandpainting18@yahoo.com</a>	660-490-0800
Herbster-Hellweg Painting*	Louis Vetz	<a href="mailto:louis@herbsterhellweg.com">louis@herbsterhellweg.com</a>	314-220-5457
Imagine Yours, Inc	Chris Dokianos	<a href="mailto:imagineyoursinc@gmail.com">imagineyoursinc@gmail.com</a>	815-592-4185
Independence Painting	Frank Source Jr	<a href="mailto:f.sorce@independencepaintingco.com">f.sorce@independencepaintingco.com</a>	630-475-3880
Jake's Painting	Jake McDowell	<a href="mailto:jakespaintinginc@gmail.com">jakespaintinginc@gmail.com</a>	321-228-3059
Jl Coatings	Joseph Isabella	<a href="mailto:jicoatings@gmail.com">jicoatings@gmail.com</a>	619-805-6080
Juan's Painting	Michael Langley II	<a href="mailto:michael@bluestar-email.com">michael@bluestar-email.com</a>	214-289-8221
K.A. Sadders	Brandon McDaniels	<a href="mailto:brandon@kaspaint.com">brandon@kaspaint.com</a>	
Keith Broussard Painting	Keith Broussard	<a href="mailto:kbninjapainting@gmail.com">kbninjapainting@gmail.com</a>	225-270-2108
Lakestone Enterprises LLC	Shane Barncord	<a href="mailto:shane@lakestonepainting.com">shane@lakestonepainting.com</a>	407-739-4599
Langley Painting	Mike Langley	<a href="mailto:mike@langleypaintinginc.com">mike@langleypaintinginc.com</a>	714-272-2651
Lankford Construction Company	Mark Zamiar	<a href="mailto:mzamiar@lcco.com">mzamiar@lcco.com</a>	708-774-5838
Majestic Construction	Edisson Zapata	<a href="mailto:edisson_zapata@yahoo.com">edisson_zapata@yahoo.com</a>	321-263-5866
MC Painting*	Micheal Arellano	<a href="mailto:Marellano@mc-painting.com">Marellano@mc-painting.com</a>	760-803-0106

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<b>Mitchell Painting and Drywal LLC</b>	Angela Mitchell	<a href="mailto:amitchell@mitchellpaintingservices.com">amitchell@mitchellpaintingservices.com</a>	816-807-7781
<b>MPG Painting</b>	Mark Gallagher	<a href="mailto:markg@mpgpainting.net">markg@mpgpainting.net</a>	916-273-0469
<b>National Coatings</b>	Zeb Hadley	<a href="mailto:z.hadley@nationalcoatingsinc.com">z.hadley@nationalcoatingsinc.com</a>	919-462-1739
<b>P&amp;M Painting</b>	Tom Henshaw	<a href="mailto:tom@pandm-painting.com">tom@pandm-painting.com</a>	815-477-7473
<b>Paint Folks</b>	Brian Foster	<a href="mailto:bfoster@paintfolks.com">bfoster@paintfolks.com</a>	888-888-7870
<b>Painters Brothers–Colors of Us of NV</b>	Zac Tanner	<a href="mailto:Zach@painterbros.com">Zach@painterbros.com</a>	
<b>PaintersUSA</b>	Mike Ausloose	<a href="mailto:musloose@paintersusa.com">musloose@paintersusa.com</a>	630-653-8715 x212
<b>Percys Powerwashing &amp; Painting LLC</b>	Giovanni Carrillo	<a href="mailto:Percypowerpaint@gmail.com">Percypowerpaint@gmail.com</a>	580-278-5364
<b>Phillips Empire LLC</b>	Chris Phillips	<a href="mailto:chris.phillips100@yahoo.com">chris.phillips100@yahoo.com</a>	
<b>Pintos Construction LLC</b>	Meydi Blagojevic	<a href="mailto:Rpintosconstruction@gmail.com">Rpintosconstruction@gmail.com</a>	208-891-3723
<b>Place Services</b>	Gabriel Place	<a href="mailto:agroover@placeservicesinc.com">agroover@placeservicesinc.com</a>	678-880-4777
<b>PowerHouse Retail Services</b>	Caitlin Hitt	<a href="mailto:caitlin.hitt@powerhousenow.com">caitlin.hitt@powerhousenow.com</a>	518-879-1180
<b>Preferred Global</b>	Justin McKenzie	<a href="mailto:jmckinzie@preferredglobal.net">jmckinzie@preferredglobal.net</a>	317-608-9173
<b>Prodigy Commercial Construction LLC</b>	Jerry R Coley	<a href="mailto:jerryc@prodigyconst.com">jerryc@prodigyconst.com</a>	614-774-1418
<b>Professional Painting C&amp;R Services*</b>	Kevin Vicente	<a href="mailto:painterservices@gmail.com">painterservices@gmail.com</a>	706-766-1596
<b>PS2</b>	John Schmit	<a href="mailto:john.schmit@ps2-inc.com">john.schmit@ps2-inc.com</a>	310-243-2980
<b>Quality Pro Wallpaper and Painting LLC</b>	Javier Reyes	<a href="mailto:qualitypro16@yahoo.com">qualitypro16@yahoo.com</a>	918-804-7001
<b>R &amp; C Painting</b>	Shauna Sterner	<a href="mailto:shauna@randcpainting.com">shauna@randcpainting.com</a>	
<b>Renovia*</b>	Paul Strack or Tom Fowle	<a href="mailto:tfowle@renovia.com">tfowle@renovia.com</a>	866-271-2148
<b>Rick Shipman Construction</b>	Rick Shipman	<a href="mailto:rickshipman@rickshipman.com">rickshipman@rickshipman.com</a>	
<b>RJB</b>	Kurt Fletcher	<a href="mailto:kfletcher@rjbcontracting.net">kfletcher@rjbcontracting.net</a>	484-255-1714
<b>Rutledge Remodel*</b>	Stephen Rutledge	<a href="mailto:stephen@rutledgeconstruction.com">stephen@rutledgeconstruction.com</a>	903-780-5783
<b>Shoenfelder Renovations</b>	John Schoenfelder	<a href="mailto:john@schoenfelderrenovations.com">john@schoenfelderrenovations.com</a>	651-387-3507
<b>Singleton Remodel*</b>	Tim Singleton	<a href="mailto:tsingleton@singletonremodel.com">tsingleton@singletonremodel.com</a>	412-719-3890
<b>Spiff Contracting*</b>		<a href="mailto:mschwartz@spiffcontracting.com">mschwartz@spiffcontracting.com</a>	
<b>Stratum Painting</b>	James Maszle	<a href="mailto:jmaszle@gmail.com">jmaszle@gmail.com</a>	
<b>Sullivan Painting</b>	Gemma Hazelwood	<a href="mailto:Gemma@sullivanpaintinginc.com">Gemma@sullivanpaintinginc.com</a>	407-946-9888
<b>Superior Painting</b>	Al Johnson	<a href="mailto:ajohnson@superior-paintingtx.com">ajohnson@superior-paintingtx.com</a>	903-521-5516
<b>Superman Painting*</b>	Carey	<a href="mailto:Carey.supermanpaintllc@outlook.com">Carey.supermanpaintllc@outlook.com</a>	
<b>Three Tier Construction LLC</b>	Preston Hardie	<a href="mailto:jphardiv@gmail.com">jphardiv@gmail.com</a>	678-603-8404
<b>Trinity Construction dba Fresh Coat Painting</b>	David Saenz	<a href="mailto:FreshCoatMT@gmail.com">FreshCoatMT@gmail.com</a>	406-361-1155
<b>Turner Painting and Construction*</b>	Erin Kleinlein	<a href="mailto:ekleinlein.tpc@gmail.com">ekleinlein.tpc@gmail.com</a>	
<b>Walters Painting</b>	Daniel Walters	<a href="mailto:dan@walterspaintinginc.net">dan@walterspaintinginc.net</a>	704-305-9489
<b>WillStand, Inc</b>	Eddrin Williams	<a href="mailto:edwill4178@gmail.com">edwill4178@gmail.com</a>	985-210-2343
<b>Whizco Construction</b>	Charlie Christopher	<a href="mailto:charlie@lcllegacy.com">charlie@lcllegacy.com</a>	214-287-4474
<b>Xavi Construction Services*</b>	Maria	<a href="mailto:admin@xaviconstruction.com">admin@xaviconstruction.com</a>	404-941-5324

\* Remodel only.

\*\* Facilities Services only.

G. Exterior Product Procurement:

1. Provide only those products purchased and distributed from the manufacturer's national distribution facilities. Comply with manufacturer's national accounts purchase order procedure to ensure integrity of product and observance of warranty.
2. Some of the specified manufacturers may permit small batch coatings to be mixed and tinted at the manufacturer's local retail or distribution site. Verify with manufacturer's authorized representative that coatings mixed and tinted in the manufacturer's retail site will receive the Manufacturer's Material Performance Warranty as described in Part 1 herein.

H. Additional and Varying Scope: Perform work as specified in this section and in accordance with paint manufacturer's

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and Owner's authorized representative's direction as necessary for unique project conditions. Work directed and performed in addition to that specified herein but deemed necessary by the Manufacturer's or Owner's Representatives to achieve a satisfactory substrate shall be by change order to the Contract.

- I. Atypical and Non-Prototypical Exterior Color Schemes: Immediately after Award of Contract, notify Coatings Manufacturer if project includes exterior metal and masonry colors not scheduled herein. Failure to notify Coatings Manufacturer of special elevations requirements may result in project delays at no cost to the Owner and Coatings Manufacturers.
- J. Coating System Quality Assurance:
  - 1. Do not substitute or interchange products or coatings systems presented at the Pre-Installation Conference unless expressly approved by Owner's authorized representative. Document conditions, products, and quantities of any authorized substitutions.
  - 2. Verify products are within shelf life.
  - 3. Refer to coating manufacturer's written recommendations for application of multi-component products.
  - 4. Verify that all coats in the proposed system are produced by the same manufacturer.
  - 5. If the coatings manufacturer's written recommendations conflict with or do not address unique project conditions, comply with the requirements of this specification.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, handle, store, and protect products in compliance with the requirements of Section 01600.
- B. At the time of delivery, paint orders shall identify the store number, location, batch number and address of project.
- C. Delivery of paint materials shall be in sealed original labeled containers, bearing 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/or reducing.
- D. Notify coating manufacturer when delivered products are nonconforming.
- E. Store coating materials in a location conforming to the manufacturers specified ambient conditions for storage and away from direct sunlight. Unless otherwise required by the manufacturer, maintain storage at temperature between 45 and 95 F.

1.10 EXTERIOR COATINGS WARRANTY

- A. Manufacturer's Extended Material Performance Warranty: The products and systems specified in the Coatings Systems Schedule in Part 3 herein have been selected by Owner as having met or exceeded Owner's Extended Material Performance Warranty criteria.
- B. Obtain a Statement of Intent to Warrant from the manufacturer for each exterior coating system used in the project. Submit the Intents to Warrant as closeout documents as specified in Part 1 herein.
- C. Performance requirements for the Manufacturers' selected coatings are as follows:

<b>STANDARD CONDITIONS</b>	The standard system is used for maintenance overcoating (over acrylic or unknown coatings on CMU) and new construction in normal climates and when substrate is not identified as having special conditions.
<b>8-Year Minimum Coatings Performance for All Exterior Metal</b>	Ferrous, Non-Ferrous, SSMR Panels
<ul style="list-style-type: none"> <li>• Remains free from of peeling, blistering, flaking, cracking, rusting, or rust bleed-through.</li> <li>• Mold and mildew resistant in accordance with the criteria of ASTM D3273.</li> <li>• Maintains adhesion to the underlying substrate or existing coating with a minimum adhesion rating of 8 in accordance with ASTM D 6677.</li> <li>• Demonstrates fading not beyond a 5 delta E value for neutral and Brand or bold color from the color at the time of initial installation as determined by ASTM D 2244 criteria.</li> </ul>	



<ul style="list-style-type: none"> <li>• Demonstrates chalking not less than a 9 from the time of initial installation as determined by ASTM D 4214 criteria.</li> <li>• Meets US VOC regulations</li> </ul>	
<b>8-Year Minimum Coatings Performance for Masonry, Concrete and EIFS Substrates</b>	
<ul style="list-style-type: none"> <li>• Coating remains free from peeling, blistering, flaking, and cracking.</li> <li>• Mold and Mildew resistant in accordance with the criteria of ASTM D 3273.</li> <li>• Maintains adhesion to the underlying substrate or existing coating with a minimum adhesion rating of 6 in accordance with ASTM D 6677.</li> <li>• Demonstrates fading not beyond a 7 delta E value for neutral colors and not beyond a 7 delta E value for the Brand or bold color from the color at the time of initial installation as determined by ASTM D 2244 criteria.</li> <li>• Demonstrates chalking not less than a 7 from the time of initial installation as determined by ASTM D 4214 criteria.</li> <li>• Passes the Wind-Driven Rain test for exterior coatings in accordance with ASTM D 6904. (Not required for EIFS unless barrier type EIFS system is installed).</li> <li>• Demonstrates a flat or low-sheen finish (Flat sheen for EIFS).</li> </ul>	
<b>8-Year Minimum Coatings Performance for Water Repellents</b>	Blended water repellent (Silane/Siloxane) for porous material.
<ul style="list-style-type: none"> <li>• Appearance of substrate remains unchanged after application.</li> <li>• Demonstrates resistant to yellowing and efflorescence.</li> <li>• Demonstrates suitability to be re-coated with conventional paints.</li> <li>• Maintains at least 99% improvement in water repellency in accordance with ASTM E 514.</li> <li>• Maintains water vapor permeance of a minimum 40 perms as determined according to test method B (wet cup) of ASTM D 1653.</li> </ul>	

<b>SPECIAL CONDITIONS</b>	In addition to the minimum criteria, coatings shall perform to the following when installed on stores identified as demonstrating special conditions.
<b>Elongation</b>	For Building conditions with excessive cracking where crack bridging is necessary. <ul style="list-style-type: none"> <li>• Material shall be capable of 300% elongation for crack bridging in accordance with ASTM D 2370.</li> </ul>
<b>Water Vapor Permeance</b>	For Buildings subjected to extreme moisture vapor transmission where a high permeance coating is required to reduce trapped moisture in the wall assembly. <ul style="list-style-type: none"> <li>• Coatings shall demonstrate water vapor permeance of a minimum 40 perms as determined according to test method B (wet cup) of ASTM D 1653.</li> </ul>

<b>REGIONAL CONDITIONS</b>	In addition to the minimum criteria, coatings shall perform to the following when installed on stores subject to one of the following climate conditions.
<b>High Ultraviolet Region</b>	For Buildings in the harsh environments of climate zones 1 and 2 with higher risk of UV degradation. <ul style="list-style-type: none"> <li>• Coatings shall demonstrate the delta E requirements described herein for the 8 years of the Minimum Performance Warranty.</li> </ul>
<b>Cold Temperature Installation</b>	In situations when the Building coatings must be installed during cold weather. <ul style="list-style-type: none"> <li>• Coatings shall be suitable for application down to 40 degrees F.</li> </ul>

1.11 EXTERIOR WORKMANSHIP WARRANTY

- A. Labor and Workmanship Warranty: Contractor shall provide an additional two years Labor and Workmanship Warranty beyond the Contractor’s one-year warranty period required in the Owner’s General Conditions. Contractor’s Labor and Workmanship Warranty shall warrant against loss of adhesion, cracking, peeling, blistering, shadow-through, splotch or non-continuous appearance, color fade, application of incorrect color, and any other surface preparation or application deficiency described herein or identified by either the coatings manufacturer or the Owner’s authorized inspection representative during its site observations.

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- B. Uncorrected deficiencies identified by Owner's Representative during the work or within two years after completion of the work may require complete recoating at Contractor's expense with no cost to the Owner.
- C. Submit the two-year Exterior Labor and Workmanship Warranty as a closeout document as specified in in Part 1 above.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Coatings for the project shall be the products of one or more of the following manufacturers as scheduled in Part 3:
  - 1. Interior Coatings:
    - a. [Benjamin Moore](#), Contact: Andrew Theokas, (201) 747-1586, [andrew.theokas@benjaminmoore.com](mailto:andrew.theokas@benjaminmoore.com).
    - b. [PPG Paints](#), Contact: Rick Garlin, (317) 318-5800, [garlin@ppg.com](mailto:garlin@ppg.com).
    - c. [Sherwin Williams Company](#), Contact: CJ Handwerk, (216) 390-1857, [Clifton.J.Handwerk@sherwin.com](mailto:Clifton.J.Handwerk@sherwin.com).
  - 2. Exterior Coatings:
    - a. [Benjamin Moore](#), Contact: Andrew Theokas, (201) 747-1586, [andrew.theokas@benjaminmoore.com](mailto:andrew.theokas@benjaminmoore.com).
    - b. [PPG Paints](#), Contact: Rick Garlin, (317) 318-5800, [garlin@ppg.com](mailto:garlin@ppg.com).
    - c. [Sherwin Williams Company](#), Contact: CJ Handwerk, (216) 390-1857, [Clifton.J.Handwerk@sherwin.com](mailto:Clifton.J.Handwerk@sherwin.com).
    - d. [Sto Corp.](#), Contact: Chuck Duffin, (888) 786-3437, [cduffin@stocorp.com](mailto:cduffin@stocorp.com).
- B. Products Schedule: Owner's preselected coating products are listed in the Product Schedules in Part 3 herein.
- C. Exterior Substrate Cleaning Agents: Cleaning agents manufactured and intended for the substrate by coatings manufacturer, or as specified herein in Part 3 – Execution.
- D. Exterior Substrate Chemical Stripping Agents:
  - 1. [Smart Strip Pro](#) by Dumond Global. Contact: Alan Bensen, National Account Manager, (973) 967-0151, [abensen@dumondglobal.com](mailto:abensen@dumondglobal.com).

### 2.2 ACCESSORY MATERIALS

- A. Accessory materials not specified herein but recommended by the manufacturer or required to meet the requirements herein.
  - 1. Paint Thinners: Type manufactured by or recommended by coating manufacturer as suitable for coating system, VOC compliant, first line commercial quality.
  - 2. Patching Materials: As specified under Part 3 - Execution.
  - 3. Masking.

## PART 3 - EXECUTION

### 3.1 IN-PROGRESS PROTECTION

- A. Protect adjacent surfaces with protective coverings, shields, or masking. Maintain protective coverings throughout cleaning and painting operations.
  - 1. Adjacent work to be protected includes but is not limited to merchandise displays, merchandise inventory, shopping carts, customer vehicles, and vegetation.
  - 2. Remove or mask hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not to be painted. Reinstall removed items after completion of paint work.
- B. Protect the following items from water damage during pressure washing and overspray during application:
  - 1. Automatic door sensors.
  - 2. Exterior light sensors.
  - 3. Store mounted electronic devices, switches, receptacles, and security components.
  - 4. Fire Protection sprinklers.

- C. Do not apply coatings in conditions that could result in overspray on vehicles or other property.
- D. Do not apply paint in areas where dust is being generated.
- E. For work specified herein requiring chemical strippers, protect adjacent substrates such as prefinished metal gutters and downspouts and aluminum storefront framing and glazing. Use plastic sheeting, tape, or other means to protect areas that are not to be stripped.

### 3.2 EXTERIOR SIGNAGE

- A. Sign Removal:
  - 1. Remove adhesive-backed interior and exterior signage attached to doors and walls to be painted.
  - 2. Dispose of removed signs.
  - 3. Do not remove large exterior mechanically attached signage.
  - 4. If location of existing sign is not shown to be covered by a new sign, repair holes and fill with sealant in accordance to the requirements of Section 07900.
- B. Signage Replacement:
  - 1. Inform Walmart Exterior Sign Team when exterior painting is complete and ready for new sign installation and replacement of removed signs. Contact Walmart Exterior Sign Install & Maintenance: Lynn Beaver, (479) 283-5970, [lynn.beaver@walmart.com](mailto:lynn.beaver@walmart.com).
  - 2. If project includes new exterior signs to be installed without a full repaint, prepare, and touch up areas left exposed around new signs as described in Part 3 herein.

### 3.3 SURFACE TESTING

- A. Apply paint to masonry surfaces only when moisture content and other surface conditions are within manufacturer's acceptable range. Do not proceed with coatings application until unsatisfactory surface conditions have been corrected.
- B. Examine surfaces and adjacent areas where products will be applied and verify by the testing methods in this article that surfaces conform to product manufacturer's requirements for substrate conditions.
- C. After cleaning and prior to painting, determine surface and subsurface moisture of non-metal substrates in compliance with the manufacturer's instructions and the following methods:
  - 1. Radio frequency and conductivity moisture meter testing with results in the green range for conductivity and the yellow range or below for radio frequency.
  - 2. Plastic sheet testing in accordance with ASTM D 4263 to determine the presence of capillary moisture. Levels are acceptable when dry under the plastic and the block.
- D. Coordinate with the Coating Manufacturer's Representative to perform any field surface test recommended by Manufacturer's Representative that enables a determination of the appropriate coating system. Verify approval by Owner's Construction Manager of any additional recommended testing.
- E. Prior to beginning exterior wall cleaning on areas receiving TCR, test areas as described in the TCR requirements in the Exterior Wall Substrate Surface Preparation paragraphs herein for Exterior Painted Masonry - Total Coating Removal (TCR).
  - 1. Dwell time and scheduling for test patches shall be in accordance with stripping agent manufacturer's written recommendation or according to stripping agent manufacturer's consultation.

### 3.4 EXTERIOR JOINT SEALANTS

- A. Joint Sealant Removal:
  - 1. CMU: Fully remove all exterior CMU wall sealants and backing materials from vertical control, construction, and expansion joints as well as sidewalk or paving joints at the CMU wall as specified in Section 07900.
  - 2. Exterior Fiber Cement Panels: Remove failing or moving sealants and any loose materials from joints.
- B. Joint Sealant Installation:

1. Protect joints to be sealed by inserting caulking backer rods at face of wall.
  2. Replace all removed sealants with new materials as specified in Section 07900.
- C. Exterior silicone sealants designated by an S1 or S2 assignment are color matched to wall coatings. Do not paint over exterior silicone sealants designated by an S1 or S2 assignment.

### 3.5 SURFACE CLEANING FOR ALL SUBSTRATES

- A. Perform complete surface contaminant removal on all substrates. Methods for achieving adequate cleaning vary depending on substrate type and susceptibility to damage.
- B. Surface cleaning methods described in this Article are the minimum requirements for adequate adhesion of new coatings to all surfaces to be repainted. Additional means and methods as required for complete surface preparation are described in Loose Coating Removal and Enhanced Surface Preparation herein below.
- C. Standard Surface Contaminant Removal by Cleaning Agents and Water Washing for All Surfaces to be Repainted:
1. Remove chalk, efflorescence, oil, grease, and surface contamination by successive passes of pressure soap and water solution washing. Pressure washing settings shall be in the range of 1000 psi to 3000 psi, not exceeding 5000 psi.
  2. Repeat passes of soap and water pressure washing until desired level of removal is achieved or alternate methods of contaminant removal are directed.
  3. EIFS Substrate: Use equipment at maximum 600 psi with fan tip.
- D. Allow surfaces to dry before applying new coatings. Prior to painting, verify dryness by testing in accordance with the manufacturer's instructions and the meter and plastic sheet methods as specified in Part 3 herein.

### 3.6 ENHANCED SURFACE PREPARATION FOR ALL SUBSTRATES

- A. For masonry restoration and repairs, perform repairs as specified in Section 04910.
- B. If any or all surfaces to be repainted are not suitable for proper adhesion after basic soap and water pressure washing, and to accomplish loose coating removal, provide enhanced means and methods as described in this Article.
- C. Enhanced Techniques for Contaminant Removal and Loose Coating Removal:
1. Pressure Washing Variations for Surface Cleaning:
  2. Target isolated problem areas by directing tip of pressure equipment from multiple angles onto the problem area.
  3. Pre-treat visible grease, oil, and other petroleum based marring with solvents in accordance with SSPC-SP1 prior to additional and repeated pressure washing passes.
  4. Use heated pressure washing equipment (200F or higher) or contractor-selected specialized equipment.
- D. Removal of Chalking: Provide a water solution with .5 lbs. of TSP per 1 gallon of water. Apply to the wall surface using a low pressure sprayer.
1. Allow 20-30 minutes before rinsing. Thoroughly rinse the surface to ensure no residue of TSP solution remains. To rinse, power wash the surface using pressure washing at the psi specified as Standard Surface Preparation herein.
  2. Scrub the surface with a soft bristled brush to remove any remaining chalk residue if necessary.
  3. Wipe a white cloth across the surface to ensure that no residue is visible on the cloth.
  4. As an alternative to TSP, a chalk removal additive recommended by the coating manufacturer can be used.
- E. Efflorescence Removal: Efflorescence is generally not removed by pressure washing methods. Remove efflorescence from masonry surfaces as specified in Section 04910.
- F. Biological Growth Removal:
1. If plants, moss, mildew, or other biological growth is identified on the surface to receive paint or surfaces directly adjacent to surfaces to receive paint, thoroughly saturate the area with a mixture consisting of 1 quart bleach/3 quarts water, and 1 cup powdered detergent.

2. Allow the mixture to remain on the surface until the biological growth is removed.
  3. Scrub the surface and repeat as necessary to assure complete removal.
  4. Thoroughly rinse with fresh water.
- G. Allow the surface to dry before applying new coatings. Prior to painting, verify dryness by testing in accordance with the manufacturer's instructions and the meter and plastic sheet methods as specified in Part 3 herein.
- H. Dispose of the wastewater as specified in the Environmental Requirements of Part 1 and in accordance with Section 01351.
- I. Continue methods of surface preparation as required in the following paragraphs and shown on the Drawings until surfaces are suitable to receive overcoats.

### 3.7 SURFACE PREPARATION – BY SUBSTRATE

- A. Substrate Preparation in this Article shall be applicable only to the extent required by project conditions and necessary for optimal adhesion and appearance of new coatings. New substrates and substrates receiving Total Coating Removal may not require all means and methods described in this Article.
- B. Interior - Metals:
1. Interior Steel:
    - a. Remove dirt, dust, grease, oil, and other surface contaminants by washing and scrubbing.
    - b. Remove rust and loose paint with power tools in accordance with SSPC-SP3.
    - c. Degloss surface with a scouring pad such as [Heavy Duty Scour Pad](#), [Non-Scratch Scour Pad](#), or equivalent by Scotch-Brite.
    - d. Feather the existing coating at transitions between the existing coating and the bare steel.
  2. Interior Galvanized Steel:
    - a. Remove dirt, dust, grease, oil, and other surface interference material by washing and scrubbing.
    - b. Remove deteriorated galvanized steel, rust, and loose paint with power tools in accordance with SSPC-SP3.
    - c. Degloss surface with a scouring pad such as [Heavy Duty Scour Pad](#), [Non-Scratch Scour Pad](#), or equivalent by Scotch-Brite.
    - d. On bare galvanizing, apply a solution of phosphoric acid and detergents designed to remove grease and oil residue to provide a clean, lightly etched surface suitable for adhesion of subsequently applied coats in accordance with the manufacturer's instructions.
    - e. Feather the existing coating at transitions between the existing coating and the bare galvanizing.
  3. Interior Painted Hollow Metal Doors (to Receive Stripping and Recoating):
    - a. If overcoating hollow metal doors and frames results in sticking, incomplete closure or latching, or surface to surface abrading of new coatings, perform Total Coatings Removal in areas of doors and frames as necessary using the chemical strippers and deglossing pads as specified in this Section.
    - b. Prepare existing coated surfaces and fully stripped surfaces as specified above for Interior Steel.
    - c. After overcoating with specified coating system, allow coatings to cure completely. Test door through multiple cycles to ensure proper closing and latching.
  4. Interior Prefinished Metal Suspended Acoustic Ceiling Grid:
    - a. Remove ceiling tiles before preparing metal grid for repainting. Protect existing to remain light diffusers and any tiles that cannot be removed.
    - b. Remove dirt, dust, grease, oil, and other surface interference material from metal grid with mild, non-residue cleaning solution and water. Lightly degloss metal grid with the fine grit abrasive pads described in this Interior Metal Surface Preparation paragraph.
- C. Interior – Masonry.
1. Interior Unpainted Masonry:
    - a. Remove efflorescence by washing and scrubbing with [Sure Klean Light Duty Concrete Cleaner](#) (formerly [Sure Klean Concrete Brick Cleaner](#)) by [Prosoco, Inc.](#) or an equivalent removal solution recommended by the coating manufacturer.
    - b. If the efflorescence cannot be removed, contact Owner's Construction Manager before proceeding.
    - c. If the surface is to be painted, measure surface pH in accordance with ASTM 4262 once for each 30 linear feet of wall surface. Wash and scrub the surface as necessary to bring the pH level within the

- range of 6 and 11.
      - d. If surface pH is outside acceptable range, notify Owner's Construction Manager.
    - 2. Interior Painted Masonry (to Receive Overcoat):
      - a. Remove dirt, dust, grease, oil, and other surface interference material by washing and scrubbing.
      - b. Sand high-gloss surfaces.
      - c. Feather the existing coating at transitions between the existing coating and concrete primer/substrate.
      - d. Spot apply primer to areas prepared to bare substrate.
- D. Interior – Other Substrate:
  - 1. Interior Gypsum Board:
    - a. New Gypsum Board: Fill minor defects with filler compound. Spot prime defects after repair.
    - b. Previously Painted Gypsum Board: Remove surface dust, debris, and loose paint. Feather the edges of removal areas to create a smooth transition.
  - 2. Interior Concrete Floors (to Receive Striping and Markings):
    - a. Mask floor surfaces that will not receive coating.
    - b. Remove visible grease and oil deposits by detergent or solvent cleaning.
    - c. Remove curing compound and sealers with solvents, commercial paint strippers, power tool cleaning, or abrasive blast cleaning using dust control methods specified herein for Total Coating Removal (TCR).
    - d. Chemically or mechanically abrade surface to a texture of 50-70 grit sandpaper.
    - e. If applying acid etching compound, thoroughly flush surface with clean water. Verify removal of acid with pH paper and allow the floor to thoroughly dry prior to painting.
    - f. Protect painted floor surface from traffic for the minimum amount of time recommended by coatings manufacturer.
- E. Exterior - Building Wall Substrates.
  - 1. Cementitious and Masonry Substrates, New:
    - a. Remove efflorescence, dust, dirt, grease, oil, chalk, and other surface contamination by pressure washing as specified above. Minimize the amount of water and dwell time to prevent saturation of the block and core-fill insulation inside.
    - b. Remove glaze by mechanical hand tools or power tools.
    - c. Allow surface to completely dry before applying new coatings. Determine surface and subsurface moisture of masonry in compliance with the manufacturer's instructions and radio frequency and conductivity moisture meter testing as specified below.
  - 2. Exterior Painted Masonry (Cleaning and Loose Coating Removal (LCR) Prior to Overcoating):
    - a. Perform Standard Surface Preparation to remove loose paint, chalk, efflorescence, oil, grease, and surface contamination by pressure washing as specified in Part 3 above.
    - b. For areas shown on the Drawings to receive Enhanced Surface Preparation, pressure wash with added variations as specified in Part 3 above or perform one or more of the following Enhanced Surface Preparation methods as required to provide suitable surface:
      - 1) Remove loose paint edges or "flags" by scraping edges to a point of tight adherence, a minimum of 12 inches or beginning of nearest block course beyond the area of poor adhesion.
      - 2) Sand high-gloss surfaces to a dull appearance.
      - 3) On scored block, grind sags, drips and bridges of existing coating covering the face of the scores.
    - c. If the degree of cleaning or surface texture differs from the approved test sample for Removal of Loose Coating in Part 1 herein, obtain Owner's Construction Manager's acceptance of the cleaned surface before proceeding.
  - 3. Exterior Painted Masonry - Total Coating Removal (TCR): On masonry shown on the Drawings or directed by Owner's authorized representative to receive Full Coating Removal, remove 90 – 95% of the coating per block or per each 128 square inch area of masonry wall to be repainted. Use chemical or media blasting methods according to equipment and product manufacturer's instructions:
    - a. Chemical Coatings Removal: Use [Dumond Smart Strip Pro](#).
      - 1) Test areas to receive TCR to determine efficacy and dwell time for stripping agent. Apply product in small equally distributed patches across TCR areas. Sample sized product packages are available for purchase through the chemical stripping manufacturer.
      - 2) Minimize the introduction of additional water into the masonry by working from top of wall to bottom. Repeat applications if necessary to reach complete removal.
    - b. Media blasting: Use the least invasive abrasive medium and provide protections as follows:

- 1) Dry abrasive blast cleaning: Provide exhaust ventilated enclosures and HEPA-rated filter vacuum dust collection systems as recommended by the manufacturer for maintaining dust emissions below the permissible level.
  - 2) Wet abrasive blast cleaning: Use proper dust control methods to maintain dust emissions below the permissible level.
  - c. Dispose of media blast waste in accordance with requirements of Section 01351 and verify that removal method is accepted by authorities having jurisdiction.
  - d. Verify that removal method is suited for climate and weather conditions in project location.
  - e. Use a removal method that is best suited to retain the texture and roughness of the surface before cleaning.
  - f. Do not use removal methods that result in a surface that is substantially different or rougher than the appearance of the approved test sample in Part 1 herein.
  - g. Do not use methods of coatings removal involving electric or gas powered infrared heat equipment, or "heat bake" methods.
  - h. Allow the surface to dry before applying new coatings. Prior to painting, verify dryness by testing in accordance with the manufacturer's instructions and the meter and plastic sheet methods as specified in Part 3 herein.
  4. Exterior Insulation and Finish System (EIFS):
    - a. Perform Standard Surface Preparation to remove loose paint, chalk, efflorescence, oil, grease, and surface contamination by pressure washing as specified in Part 3.
    - b. For Enhanced Surface Preparation, supplement pressure washing with light hand scrubbing and detergent cleaning as necessary to remove chalk, surface interference material, and loose coating. Use caution to ensure EIFS finish is left intact after Enhanced Preparation.
    - c. Allow the surface to dry before applying new coatings. Prior to painting, verify dryness by testing in accordance with the manufacturer's instructions and the meter and plastic sheet methods as specified in Part 3 herein.
  5. Exterior Fiber Reinforced Cement Panels (FRCP):
    - a. Clean surfaces of panels by methods recommended by FRCP manufacturer to remove grease and oil residue, efflorescence, and other contaminants to provide a clean, lightly etched surface suitable for adhesion of subsequently applied coats.
    - b. Where pressure washing is not feasible, clean surfaces by methods including compressed air, hand washing with biodegradable detergent and sponge or rags, broom cleaning, or solvent based cleaners.
    - c. If mildew is present, use mildew removal method as recommended by the FRCP manufacturer.
    - d. Rinse any remaining chemical films left by solvent cleaners.
  6. Exterior Gypsum Board:
    - a. New Gypsum Board: Exterior gypsum board sheathing to receive a paint finish shall be prepared for painting with joint treatment and skim coating as specified in Section 09250.
    - b. Previously Painted Gypsum Board: Remove surface dust, debris, and loose paint. Feather the edges of removal area to create a smooth transition.
- F. Exterior – Miscellaneous Concrete Substrates: Exterior Concrete Light Pole Bases and Concrete Bollards:
1. Prior to overcoating, remove loose paint, chalk, efflorescence, oil, grease, and surface contamination by methods specified in this Part 3.
- G. Exterior – Metal.
1. Exterior Steel (Substrate is Fair to Good Condition, including New and Unpainted Steel):
    - a. Remove dust, dirt buildup, grease, oil, mold, mildew, chalk, dirt, and surface debris. Pressure wash as specified in Part 3 herein to clean the surface.
    - b. Remove rust not tightly adhered, loose paint, and surface contamination with power tools in accordance with SSPC-SP3.
    - c. Sand glossy surfaces with 220 grit sandpaper.
    - d. Feather the existing coating at transitions between the existing coating and the bare steel.
  2. Exterior Steel (Steel Substrate or Steel-to-Ground Interface is Heavily Corroded):
    - a. Remove dust, dirt buildup, grease, oil, mold, mildew, chalk, dirt, and surface debris. Pressure wash as specified in Part 3 herein to clean the surface.
    - b. Spot-remove extensive rust and rust scale by power tool to the visual appearance recommended by the standards of SSPC-SP15.
    - c. Repair holes as indicated on Drawings by welding and grinding.

- d. Clean heavily corroded steel at the ground interface (steel that is in contact with an at-grade surface such as concrete or asphalt to 12 inches above grade, or to the top of corroded area, whichever is greater. Within this area, remove corrosion, mill scale, and coatings by power tool cleaning in accordance with SSPC-SP15.
- e. Feather the existing coating at transitions between the existing coating and the bare steel.
3. Exterior Galvanized Steel (Substrate is Fair to Good Condition, including New and Unpainted Steel):
  - a. Remove dust, dirt buildup, grease, oil, mold, mildew, chalk, dirt, and surface debris. Pressure wash as specified in Part 3 herein to clean the surface.
  - b. Remove loose coating, corrosion, deteriorated steel, and zinc salts by power tool in accordance with SSPC-SP3. Feather the edges of the existing coating around each cleaned spot.
  - c. Sand glossy surfaces with 220 grit sandpaper.
  - d. On bare galvanizing, apply a solution of phosphoric acid and detergents designed to remove grease and oil residue to provide a clean, lightly etched surface suitable for adhesion of subsequently applied coats in accordance with the manufacturer's instructions.
  - e. Feather the existing coating at transitions between the existing coating and the bare galvanizing.
4. Exterior Galvanized Steel (Galvanized Substrate or Galvanized-to-Ground Interface is Heavily Corroded):
  - a. Remove dust, dirt buildup, grease, oil, mold, mildew, chalk, dirt, and surface debris from areas shown on the Drawings to be Heavy Corrosion. Pressure wash as specified in Part 3 herein to clean the surface.
  - b. Spot-remove deteriorated steel, rust and rust scale to bright metal by power tool in accordance with SSPC-SP15.
  - c. Repair holes with new metal.
  - d. Clean heavily corroded galvanized steel from the ground interface (in contact with an at-grade surface such as concrete or asphalt) to 6 inches above grade, or to the top of corroded area, whichever is greater. Clean to bright metal by power tool in accordance with SSPC-SP15, allowing intact galvanizing to remain.
  - e. After power tool cleaning, treat bare galvanizing with a solution of phosphoric acid and detergents designed to remove grease and oil residue to provide a clean, lightly etched surface suitable for adhesion of subsequently applied coats in accordance with the manufacturer's instructions.
  - f. Feather the existing coating at all transitions between the existing coating and the bare galvanizing.
5. Metal Canopy Columns and Miscellaneous Supporting Steel Structures – Existing Field Painted or New:
  - a. Pressure wash with a minimum 2,400 PSI detergent mixture to remove loose coating, dust, dirt buildup, grease, oil, mold, mildew, and chalk.
  - b. If necessary, remove loose coating by power tool cleaning to bare metal in accordance with the standards of SSPC-SP3.
  - c. Sand the existing coating and substrate with 120-220 grit sandpaper or abrasive medium of choice to a minimum surface profile (roughness) of 1.0 mil for adhesion of the primer. Feather any edges of remaining existing coating if applicable.
  - d. Solvent wipe the substrate to remove remaining dust and residue with acetone or like non-oil forming solvent.
6. Prefinished Standing Seam Metal – Existing to be Painted:
  - a. Pressure wash as specified in Part 3 herein to remove dust, dirt buildup, grease, oil, mold, mildew, and chalk.
  - b. If necessary, remove loose coating with power tools to bare metal.
  - c. Remove surface-mounted snow guards, if present, and re-install upon completion of work.
  - d. Sand the existing coating and substrate with 120-220 grit sandpaper to a dull appearance and a minimum surface profile (roughness) of 1.0 mil for adhesion of the primer. Test for adhesion after sanding.
  - e. Solvent wipe the substrate to remove remaining dust and residue.
7. Fabric Pickup Canopy Prefinished Metal Components, Prefinished Metal Roof Edge Fascia (including Pickup Canopy Fascia), Prefinished Canopy Deck Panels, and Prefinished Canopy Gutters – Existing Factory Fluoropolymer Coated to be Field Painted:
  - a. Fabric canopy: Remove fabric from steel structure prior to beginning preparation and paint work.
  - b. Pressure wash substrate receiving paint as specified in Part 3 herein to remove loose coating, dust, dirt buildup, grease, oil, mold, mildew, and chalk.
  - c. If necessary, remove loose coating with power tools to bare metal.
  - d. Sand the existing coating and substrate with 120-220 grit sandpaper to a minimum surface profile (roughness) of 1.0 mil for adhesion of the primer.



- e. Solvent wipe the substrate to remove remaining dust and residue
- f. Fabric canopy: Reinstall fabric on steel structure when painted substrates have fully dried.

H. Wood:

1. Remove surface contamination by washing with a cleaning solution, scraping, sanding, and scrubbing to remove dirt, pollutants, mildew, deteriorated wood, and surface interference material.
2. Allow to dry and apply patching material recommended by the coating manufacturer to fill cracks, nail holes, and other imperfections. Sand the patched areas smooth after drying.
3. Scrape and clean small, dry, seasoned knots and apply a thin coat of knot sealer recommended by the coating manufacturer before applying prime coat.
4. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dry.
5. Prime, stain, or seal wood required to be field painted immediately upon delivery to site. Prime edges, ends faces, undersides, and backsides of such wood, including cabinets and counters.
6. Seal tops, bottoms, and cut-outs with a heavy coat of sealer recommended by the coating manufacturer immediately upon delivery to the site.
7. Allow the surface to dry before applying new coatings. Prior to painting, verify dryness by testing in accordance with the manufacturer's instructions and the meter and plastic sheet methods as specified in Part 3 herein.
8. If staining new exposed wood or restaining existing exposed wood is included in project, contact coatings manufacturer aligned to project for appropriate stain.

- I. Overhead Sectional Doors: Clean surface and sand to dull appearance as recommended by manufacturer. Thoroughly wash with an abrasive cleanser or wash and dull by sanding.

3.8 APPLICATION - GENERAL

A. Mixing and Thinning:

1. Mix coatings in clean containers in accordance with the manufacturer's published instructions.
2. Remove skins on acrylic coatings prior to mixing. Strain mixed coatings prior to use.
3. Stir paint materials as necessary during use to maintain the consistency.

- B. Apply paint to surfaces free of dirt, rust, scale, grease, moisture, scuffed surfaces, and conditions otherwise detrimental to formation of a durable paint film.

- C. Touch up shop-applied prime coats where damaged or bare. Use the same primer applied in the shop or equivalent approved primer.

- D. If application procedures are not specified herein, use application procedures designated by the manufacturer's published instructions for the particular application and substrate.

- E. Dry Film Thickness (DFT) shown in the Product Schedules in Part 3 herein represent the minimum Dry Film Thickness in mils per coat. Apply each coat to uniform coverage. Avoid excessive thickness that results in runs, sags, and solvent voids in the film.

- F. Measure or allow to be measured the Wet Film Thickness (WFT) of exterior coatings on CMU if manufacturer's representative or Owner's authorized representative requires.

- G. Allow drying time between coats as recommended by the manufacturer. Ambient humidity and low temperatures result in longer dry, recoat, and service times.

- H. When coating irregular surfaces including edges, corners, crevices, welds, and exposed fasteners, apply a minimum dry film thickness equivalent to that of flat surfaces.

- I. Prime Coats, General: Before application of finish coats, apply a prime coat of material as scheduled. Recoat primed and sealed surfaces if needed in areas where porosity or nonuniform appearance exists.

1. Additional prime coat requirements for Exterior CMU and masonry are provided in the articles following herein.

- J. Exterior Sign Replacement: If exterior elevation bearing new signage is not shown to be entirely repainted after sign replacement, prepare areas left exposed after new signage is installed as required herein in Substrate Preparation. Touch up exposed areas as follows:
  - 1. Blend new coats to create a color and sheen undiscernible from a distance of 3 feet from the existing adjacent coats. Feather new coats toward edges of exposed areas to produce a thickness equal to existing adjacent coats.
- K. Pigmented (Opaque) Finishes: Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance and coverage. Apply additional coats if shadow through of underlying coats or substrate is visible. Cloudiness, spotting, laps, brush marks, runs, sags or other surface imperfections will not be acceptable.
- L. Pigmented Waterproofing Coatings for Masonry Wall Caps:
  - 1. Apply a specialized coating system as specified in the Drawings and Paint Schedule. Match the existing color of the cap.
    - a. Epoxy/Urethane – Prime with one coat of specified primer per manufacturer’s instructions. When primer is cured, apply two coats of finish coat specified per manufacturer’s instructions.
    - b. Cement-based – Brush onto the bare surface to achieve the manufacturer’s DFT (dry film thickness) recommendations. Stripe-coat corners and edges.
  - 2. Apply waterproofing coating to the top and vertical sides of painted wall caps. Maintain a continuous seal between the waterproofing coating and the finish coating on the vertical sides to 1” below the cap. When waterproof coating has cured, apply the finish coating over the waterproof coating up to the bottom of the cap.

### 3.9 APPLICATION OF COATINGS TO MASONRY/CMU

- A. General:
  - 1. Concrete masonry unit walls shall have been installed at least 21 days prior to coating application.
  - 2. Begin system application at top of wall and work down.
  - 3. Apply cold weather coatings at surface and ambient temperatures at or above manufacturer’s recommended application temperatures and rising.
  - 4. Do not use a sprayer extension for coatings application on split face concrete masonry unit walls.
- B. Exterior Wall Masonry and Concrete Masonry Unit Coatings:
  - 1. General:
    - a. Where existing coatings to be overcoated vary in color or condition, verify that substrate preparation and scheduled coatings systems are sufficient for yielding a uniform finish color and sheen.
    - b. Apply by spray and roller application, using airless equipment for spray application and backrolling with roller.
    - c. Apply at rate adequate to provide complete coverage and to the minimum dry film thickness (DFT) shown in the Product Schedule as recommended by the coating manufacturer for each coat in the system.
    - d. Allow measurement of the manufacturer’s recommended wet film thickness (WFT) for finish coatings on Exterior CMU.
  - 2. Masonry/CMU Primers: Apply primer coats as follows:
    - a. Spray first coat of surfacer material vertically with nozzle tip at a 45 degree angle from surface. Point nozzle tip down when moving upward, and up when moving downward. Back roll with saturated 1 inch minimum nap roller to completely fill voids in substrate.
    - b. Allow for high humidity and low temperature where two coats of primer are specified.
      - 1) Spray the second coat of primer material horizontally with nozzle tip at a 45 degree angle from surface. Point nozzle tip left when moving right, and right when moving left. Follow with back rolling.
    - c. Repeat the application sequence described in the preceding paragraphs until all specified coats are applied.
    - d. For each coat, back brush the top edges of block and the scores of scored block to assure complete coverage.
  - 3. Masonry/CMU Finish Coats: Apply finish material as follows:
    - a. Spray first coat vertically with nozzle tip at 45 degree angle from surface. Point nozzle tip left when moving right, and right when moving left. Back roll vertical pass with saturated 1 inch minimum nap roller before proceeding with second coat.
    - b. For coatings systems specified to receive two coats of finish material, spray second coat horizontally

with nozzle tip at 45 degree angle from surface. Point nozzle tip down when moving upward, and up when moving downward.

- c. Back brush the top edges of block and the scores of scored block to assure complete coverage. Cross roll roller-applied material. Finish material with brush and roller strokes in one direction.
4. Verify that all phases of the finish coating application yield a uniform color and sheen that match the color and sheen of the approved coating field samples. Recoating any phase or location on the exterior CMU walls to correct color inconsistencies will be at the expense of the Contractor with no cost to the Owner.
5. Verify that finish coats are without cloudiness, spotting, laps, brush marks, runs, sags, or shadow through.
6. Pinhole Allowances: Where an elastomeric finish coat is specified in the System Schedule herein, provide a completed coatings application with no more than 10 pinholes per square foot. For all other coating systems in the System Schedule herein, provide a completed coatings application with no more than 20 pinholes per square foot.

C. Water Repellents for Integrally Colored Masonry and Unpainted Concrete Caps and Sills: Water repellents are specified in Section 07190. Water repellent for galvanized wall caps is specified in the System Schedules herein.

D. Additional Considerations for Exterior Masonry Prime Coats: Prime coat type or thickness may depend on the condition of the substrate after field preparation does not yield typical results. Where additional determination regarding prime coat is based on atypical substrate conditions, verify with Owner's Construction Manager, Owner's Project Manager, and Coating Manufacturer's recommendations.

1. If the project includes spot-preparation resulting in coarsely textured bare substrate, provide the surfacer prime coat in the system to match thickness of surrounding coats. After priming the full removal spot with high build surfacer to match existing coatings, continue applying the finish coats as specified.
2. If prepared substrate demonstrates chalking, provide the conditioner prime coat in the system.

### 3.10 MECHANICAL AND ELECTRICAL EQUIPMENT

A. Replace identification markings on mechanical or electrical equipment when painted over or spattered.

B. Where exposed piping, conduit, and electrical equipment are to be painted, paint color and texture shall match adjacent surfaces.

C. Paint both sides and edges of plywood backboards for electrical equipment prior to installation.

D. Pre-paint gas piping prior to installation. Touch up paint after installation to repair damage. Colors shall be as follows:

1. Exterior Piping on Roof (Yellow): P5, OSHA Standard "Safety Yellow."
2. Interior Piping in Receiving and Stockroom Areas (Yellow): P5, OSHA Standard "Safety Yellow."
3. Piping in all Other Areas: Color to match adjacent surfaces.

### 3.11 INTERIOR FIELD QUALITY CONTROL

A. Interior Coatings and Exterior Coatings on Surfaces Other than Exterior Wall: Inspect painting and coating application for scheduled material, color, sheen, specified thickness (WFT where indicated and DFT), and coverage.

### 3.12 EXTERIOR FIELD QUALITY CONTROL

A. Exterior Wall Pre-Installation Testing:

1. Prior to the Pre-Installation Conference specified in Part 1, conduct knife or tape adhesion tests of the existing exterior wall coatings in accordance with ASTM D6677.
2. Test multiple locations on all elevations of the building. If more than one texture masonry is used, conduct at least one test per elevation of each type or texture of masonry.
3. Provide the results to the manufacturer of the new coating to confirm that the adhesion is adequate for over-coating. If the manufacturer indicates that the adhesion is inadequate, advise the Owner's authorized representative.
4. Discuss inadequate adhesion results at the Pre-Installation Conference. Do not proceed with painting work until a decision is made regarding over-coating.

- B. Contractor's Exterior Wall In-Progress Inspections:
  - 1. Contractor's Installation Inspections:
    - a. Maintain schedule of application of exterior wall systems in field office for Owner's review.
    - b. Enter any painting defects defined as deviations, as well as recommended repairs by Owner's Construction Manager or Manufacturer's Technical Representative during progress inspections into the online Owner's Observation Log.
    - c. Maintain photographic documentation of application to be included in Contractor's Completion Report and submitted as a closeout submittal as specified in Part 1 herein.
    - d. Conduct the following inspections and tests each day, as applicable. Document and make available to the Owner's Construction Manager.
      - 1) Ambient conditions during the work, including air temp, surface temp, relative humidity, dew point.
      - 2) Quality of surface preparation on each item prepared, including cleanliness and roughness, removal of chalk and loose paint, removal of biological growth, de-glossing, pressure washing, power tool cleaning, etc.
      - 3) Moisture content of cementitious surfaces prior to painting.
      - 4) Application, including product names, quantities, and locations of coatings applied.
      - 5) Methods of application, including whether spray, brush, roll, back-rolling, etc.
      - 6) Wet film thickness of coatings applied as measured at a minimum of 5 spots per 100 square feet or fraction thereof. Dry film thickness of coatings applied to metal as measured at a minimum of 5 spots per 100 square feet or fraction thereof.
      - 7) Quality of application, including aesthetics, coverage, presence of pinholes and shadow-through.
- C. Exterior Wall Post-Installation Inspections: Upon completion of the coating system installation, contact and schedule site visits with the Manufacturer's Technical Representative .
  - 1. Scheduling and Attendance:
    - a. Provide a minimum one week notification for the scheduling of Manufacturer's final inspection. Manufacturer's Representative shall be the same individual present at pre-construction conference.
    - b.
  - 2. Agenda:
    - a. Verify Representatives' observations include inspection of all specification requirements and comparison with the sample panel specified herein.
    - b. Record noted deficiencies and recommendations observed by the Representatives.
- D. Remediation of Deficiencies: If the Owner's or Manufacturer's post-installation inspections note deficiencies, provide remediation as recommended by the inspection reports to achieve compliance with the specified requirements.
  - 1. Record products, methods of application, location, and quantities of coatings for remediation work.
- E. Fine for Failure to Remediate: If the Manufacturer's Representative or Owner's authorized representative determine that remediation work is not complete in accordance with the recommendations of the post-installation report and in conformance with the requirements herein, Owner may assess a fee of \$3,000.00 at Contractor's expense with no cost to the Owner.

### 3.13 MAINTENANCE OF WORK AREA

- A. As work proceeds and upon completion, remove paint where spilled, splashed, or spattered.
- B. During progress of work keep premises free from unnecessary accumulation of tools, equipment, surplus materials and debris. At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint material from the site.
- C. Collect waste, cloths, and material which may constitute a fire hazard, place in closed metal containers, and remove daily from site.
- D. Upon completion of work, leave premises neat and clean. Remove protective coverings and paint from doorknobs, floors, counter tops and other areas not requiring paint.

### 3.14 PROTECTION

- A. Repair damage as a result of inadequate or unsuitable protection during preparation or installation.
- B. Do not leave plastic or other landscape protection covers in place so long that damage to plants results.

3.15 PAINT COLOR SCHEDULES

- A. Exterior Colors: The following are Owner’s preselected paint colors currently used in the exterior building scheme. Provide colors as shown or scheduled on the drawings or to match existing scheme. Do not substitute the following exterior colors.
- B. Sherwin Williams exterior colors are listed by proprietary name in the Interior Color Schedule.

Mark	Color Description	PPG	Benjamin-Moore	Sto
P5(E)	Safety Yellow	90-330 Safety Yellow	Safety Yellow # 10	---
P15(E)	Gray	1010-5 Downpour	AC-27 Galveston Gray	--
P21(E)	Safety Red	90-306 Safety Red	Safety Red # 20	---
P33(E)	Cream	1023-1 Oatmeal	2149-70 White Chocolate	#16032
P36(E)	Black	1001-7 Black Magic	2118-20 Toucan Black	#37100
P49(E)	Dark Gray	1007-6 Cool Charcoal	HC-167 Amherst Gray	NA19-0019
P76(U)	Walmart Blue	Custom Factory Match	Walmart Blue	NA19-0014
P81(E)	Black	1001-7 Black Magic	2132-20 Ebony King	#37100
P83(E)	Dark Brown	1077-6 Salted Pretzel	1022 Maple Shadows	#32131
P94(E)	Tan	1087-5 Cracker Bitz	1129 Hidden Oaks	#16042
P124(E)	Light Brown	1085-5 Sauteed Mushroom	1034 Clay	#16061
P134(E)	Light Gray	1006-3 Early Evening	1465 Nimbus	NA19-0020
P135(E)	Medium Gray	1007-4 Hot Stone	1474 Cape May Cobblestone	NA19-0018
P140(E)	White	1007-1 Willow Springs	2141-70 Vanilla Milkshake	NA19-0017
P162(E)	Black Gray	0997 Summer Shadow	Walmart Charcoal	NA20-0026
P200(E)	Duranodic Bronze	1008-7 Stone’s Throw	2134-10 Night Horizon	Contact Chuck Duffin, (888) 786-3437, <a href="mailto:cduffin@stocorp.com">cduffin@stocorp.com</a>
P205(U)	Dark Blue	95-3300 Durethane Mastic	Walmart Dark Blue 632-4X and N403-4X	NA20-0016
P214(E)	Medium Brown	#1021-4 Diversion	#998 Cabot Trail	#32233
P215(E)	Light Tan	#1021-2 Synchronicity	#996 Ashen Tan	#32223
P216(E)	Dark Brown	#1021-6 Curlew	Northwood Brown 1000	#32230
P217(E)	Dark Bronze	#1021-7 Cabin Fever	HC-72	#32144

- C. Interior Colors: The following interior colors are shown on drawings if included in project. Current prototype colors are highlighted. Provide matches by any approved manufacturer.
  - 1. Colors included in this list may also serve as Basis for Design for proprietary color matches to interior or exterior building elements specified in the scope of other Sections.

Mark	Color Number/Name by Sherwin Williams unless otherwise shown.
P2	SW# 7664 Steely Gray
P3	SW# 6510 Loyal Blue
P5	OSHA Standard Safety Yellow
P6	SW# 6811 Honorable Blue

Mark	Color Number/Name by Sherwin Williams unless otherwise shown.
P7	Pittsburgh Paints #2537 Blossom White
P8	SW# 7005 Pure White
P9	SW# 7042 Shoji White. Apply over textured coating specified in Section 09250

Mark	Color Number/Name by Sherwin Williams unless otherwise shown.
P10	SW# 6061 Tan Bark
P11	SW# 6115 Totally Tan
P12	SW# 6112 Biscuit
P13	SW# 6454 Shamrock
P14	SW# 6677 Goldenrod
P15	SW# 7669 Summit Gray
P16	SW# 7074 Software
P18	SW# 7507 Stone Lion
P19	SW# 6094 Sensational Sand
P20	SW# 7036 Accessible Beige
P21	SW# 4081 Safety Red
P22	Pantone Color System 286 C
P23	SW# 7005 Pure White (Sam's Club)
P24	SW# 2819 Downing Slate
P25	SW# 0045 Antiquarian Brown
P26	SW# 6080 Utterly Beige
P27	SW# 6103 Tea Chest
P28	SW# 6124 Cardboard
P29	SW# 6420 Queen Anne's Lace
P30	SW# 2018 Pink Beige
P31	SW# 2016 Canberra
P32	SW# 6387 Compatible Cream
P33	SW# 6385 Dover White
P34	SW# 6519 Hinting Blue
P35	SW# 7071 Gray Screen
P36	SW# 6989 Domino
P37	SW# 0046 White Hyacinth
P38	SW# 6102 Portabello
P39	SW# 6122 Camelback
P40	SW# 6665 Gardenia
P41	SW# 6100 Practical Beige
P42	SW# 6372 Inviting Ivory
P43	SW# 6667 Afterglow
P44	SW# 6666 Enjoyable Yellow
P45	SW# 0044 Hubbard Squash
P46	SW# 7006 Extra White
P47	SW# 0051 Classic Ivory
P48	SW# 7722 Travertine
P49	SW# 7019 Gauntlet Grey
P50	SW# 6382 Ceremonial Gold
P51	SW# 6662 Summer Day
P52	SW# 6334 Flower Pot
P53	SW# 6810 Lupine
P54	SW# 6432 Garden Spot
P55	SW# 6285 Grape Harvest
P56	SW# 6500 Open Seas
P57	SW# 2848 Roycroft Pewter
P58	SW# 6006 Black Bean
P59	SW# 0077 Classic French Gray
P60	SW# 6053 Reddened Earth
P61	SW# 6079 Diverse Beige
P62	SW# 6172 Hardware.
P63	SW# 2340 Buff

Mark	Color Number/Name by Sherwin Williams unless otherwise shown.
P64	SW# 6332 Coral Island
P65	SW# 6378 Crisp Linen
P66	SW# 6085 Simplify Beige
P67	SW# 6114 Bagel
P68	SW# 6113 Interactive Cream
P69	SW# 6340 Baked Clay.
P70	SW# 2838 Polished Mahogany
P71	SW# 7051 Analytical Gray.
P72	SW# 6658 Welcome White.
P73	SW# 6214 Underseas
P74	SW# 6659 Captivating Cream
P75	SW# 2804 Renwick Rose Beige
P76	Custom Match # 076 Walmart Medium Blue
P76A	Pantone Color System 285C
P77	SW# 6087 Trusty Tan
P78	SW# 2445 Creamy White
P79	SW# 6359 Sociable
P80	SW# 6060 Moroccan Brown
P81	SW# 6258 Tricorn Black
P82	SW# 7679 Golden Gate
P83	SW# 6082 Cobble Brown
P84	SW# 7641 Collonade Gray
P85	SW# 2823 Rookwood Clay
P86	SW# 6356 Copper Mountain
P87	SW# 2807 Rookwood Medium Brown
P88	SW# 7517 China Doll
P89	SW# 6062 Rugged Brown
P90	SW# 7502 Dry Dock
P91	SW# 7513 Sanderling
P92	SW# 7536 Bittersweet Stem
P93	SW# 7538 Tamarind
P94	SW# 7694 Dromedary Camel
P95	SW# 7702 Spiced Cider
P96	SW# 7705 Wheat Penny
P97	SW# 7710 Brandy Wine
P98	SW# 7718 Oak Creek
P100	SW# 6521 Notable Hue
P101	SW# 6904 Gusto Gold
P102	SW# 7518 Beach House
P103	SW# 6095 Toasty
P104	SW# 6867 Fireworks
P105	SW# 6526 Icelandic
P106	SW# 6675 Afternoon
P107	SW# 7698 Straw Harvest
P108	SW# 6991 Black Magic
P109	SW# 7506 Loggia
P110	SW# 7043 Worldly Gray
P111	SW# 7531 Canvas Tan
P112	SW# 6676 Butterfield
P113	SW# 6674 Jonquil
P114	SW# 7720 Deer Valley
P115	SW# 6076 Turkish Coffee

Mark	Color Number/Name by Sherwin Williams unless otherwise shown.
P116	Custom Match #116 Walmart Neighborhood Market Green
P116A	Pantone Color System 368 C
P117	SW# 6429 Baize Green
P118	SW# 6720 Paradise
P119	SW# 6895 Laughing Orange
P120	SW# 6887 Navel
P121	SW# 6905 Goldfinch
P122	SW# 6413 Restoration Ivory
P123	SW# 6380 Humble Gold
P124	SW# 7522 Meadowlark
P125	SW# 6923 Festival Green
P126	SW# 6885 Knockout Orange
P127	SW# 7719 Fresco Cream
P128	SW# 7510 Chateau Brown
P129	SW# 6683 Bee
P130	SW# 6922 Outrageous Green
P131	SW# 7102 White Flour
P133	Pantone Color System 287 C
P134	SW #7015 Repose Gray
P135	SW #7017 Dorian Gray
P139	SW #6710 Melange Green
P140	SW #7004 Snowbound
P150	SW #7072 Online
P159	SW# 7571 Casa Blanca
P161	SW #7609 Georgian Revival Blue

Mark	Color Number/Name by Sherwin Williams unless otherwise shown.
P162	SW# 7674 Peppercorn
P163	SW# 6939 Turquoise
P164	SW# 6002 Essential Gray
P165	SW# 6105 Divine White
P166	SW# 6766 Mariner
P167	SW #6868 Real Red
P200	Walmart Duranodic Bronze
P201	SW #7668 March Wind
P202	SW #7670 Gray Shingle
P203	SW #7048 Urbane Bronze
P204	SW #0019 Festoon Aqua
P205	Pantone Color System 282
P206	SW #7000 Ibis White
P207	HGSW #1465 Contemporary Grey (Custom) One-Gallon Formula: Extra White Base CCE*Colorant 02 32 64 128 B1-Black 2 2 1 1 Y3-Deep Gold - 5 - -
P208	SW #6953 Candid Blue
P209	SW #7064 Passive
P210	SW #6959 Blue Chip
P211	SW #6249 Storm Cloud
P212	Sam's Club Teal (custom color)
P213	SW #6506 Vast Sky

3.16 PAINT SHEEN SCHEDULE

A. Gloss:

1. Exterior metal surfaces:
  - a. Roof edge fascia.
  - b. Fabric canopy supporting steel structure and components.
  - c. Where selected coating manufacturer's approved metal products are semi-gloss, semi-gloss sheens for metals shall be acceptable in lieu of gloss.
2. Exterior hollow metal doors and frames (inside and outside surfaces).
3. Exterior Insulation and Finish System to receive coatings with urethane-like performance.
4. Exterior CMU walls to receive coatings with urethane-like performance.
5. Roof hatch (inside and outside surfaces).
6. Interior & exterior pipe bollards shown to be painted.
7. Interior & exterior metal railings.
8. Metal stair stringers and handrails.
9. Metal fixed ladders and cages.
10. Exterior composite overhead sectional door surface if shown to be painted.
11. Automotive Center surfaces including Service Area (below 8 ft above finish floor).

B. Semi-gloss:

1. Interior hollow metal doors and frames.
2. Interior hollow metal window frames.
3. Wood trim or simulated wood trim scheduled to be painted.
4. Coiling metal counter doors, except aluminum coiling counter shutters at Pharmacy.
5. Toilet gypsum board ceilings.
6. All walls within Pharmacy and exterior face of Pharmacy front wall (sales floor side).
7. Interior columns surfaces to receive epoxy finish.
8. Exterior fiber reinforced cement panels if shown to be painted.

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- C. Eggshell:
  - 1. All surfaces to be painted where sheen is not otherwise specified.
- D. Flat:
  - 1. Exterior Insulation and Finish System unless noted otherwise.
  - 2. Exterior gypsum board ceilings.
  - 3. Exterior concrete.
  - 4. Exterior CMU walls unless noted otherwise.

3.17 ITEMS TO BE PAINTED SCHEDULE

- A. Paint surfaces as shown or scheduled on the drawings including.
  - 1. Exterior: Paint existing exterior surfaces and new exterior surfaces as shown and noted on the Drawings, including, but not limited to:
    - a. Hollow metal doors and frames.
    - b. Metal opening frames and trim.
    - c. Metal or fabric canopy columns and supporting steel structure components where shown on Drawings.
    - d. Exterior Insulation and Finish System.
    - e. Metal flashing and downspout (surfaces exposed from ground level).
    - f. Metal gutters (surfaces exposed to view from ground level).
    - g. All surfaces of metal parapet cap.
    - h. Parapet walls, roof side (where roofing does not occur).
    - i. Pipe bollards where shown to be painted.
    - j. Metal railings.
    - k. Roof hatch.
    - l. Satellite dish support (from bottom of deck to top of support).
    - m. Exposed rooftop refrigeration and HVAC support framing.
    - n. Overhead doors if shown.
    - o. Concrete masonry.
    - p. Paving graphics and markings.
    - q. Exposed piping and conduit, hangers and supports.
    - r. Exterior fiber reinforced cement panels if shown to be painted.
  - 2. Interior: Paint existing and new interior surfaces as indicated on the Drawings including, but not limited to:
    - a. Hollow metal doors and frames.
    - b. Hollow metal window frames.
    - c. Overhead coiling doors.
    - d. Metal opening frames and trim.
    - e. Metal acoustic ceiling grid.
    - f. Gypsum wallboard.
    - g. Exposed concrete unit masonry.
    - h. Pipe Bollards shown to be painted.
    - i. Metal railings.
    - j. Exposed plywood.
    - k. Plywood wainscot, if shown to be painted.
    - l. Exposed mechanical ductwork, hangers and supports (if scheduled to be painted).
    - m. Exposed piping and conduit, hangers and supports (where exposed to Customer view if exposed structure is painted).
    - n. Exposed fire protection piping, hangers and supports (where exposed to Customer view if exposed structure is painted).
    - o. Exposed overhead structure including joists, girders, bridging, miscellaneous metal fabrications and deck (if scheduled to be painted).
    - p. Exposed structure columns.
    - q. Floor striping, graphics, and markings as shown or noted.
    - r. Metal stair stringers and handrails.
    - s. Exposed wood trim.
    - t. Automotive Center service pit metal surfaces.

- B. Do not paint the following Items:

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1. Aluminum, brass, bronze, stainless steel, and chrome plated steel, unless otherwise shown or specified.
2. UL, FM, and other code-required labels.
3. Equipment identification, performance rating, and name plates.
4. Finish hardware.
5. Fire Suppression sprinklers.
6. Low voltage cabling not in conduit, such as fire alarm, voice, data, EMS, audio, or security.
7. Refrigerant piping insulation.
8. Stainless steel floor drain grates at coolers and freezers.
9. Recycled interior HDPE plastic man doors.
10. Generally, pre-finished items and equipment such as toilet compartments, mechanical and electrical equipment, and factory finished metal panels and trim, unless otherwise shown or specified. Where pre-finished items are to receive paint, see Interior Metal Surface Preparation above herein.

3.18 PRODUCT SCHEDULES - EXTERIOR

- A. Refer to the following schedules to verify exterior coating characteristics, manufacturer's recommended DFT, and installation temperature for the coatings in the selected system.
- B. Exterior Product Selection:
  1. Building Wall Coatings: Owner has preselected one manufacturer of exterior wall coatings for the project based on a national territory alignment as represented in the following map.
  2. Metal Coatings: If Coatings Manufacturer assigned to project territory does not supply metal coatings, Contractor shall select one exterior coatings manufacturer among those scheduled below offering coatings on exterior metal substrate.

AL, CT, DE, FL, GA, IN, KY, MA, MD, ME, MI, MS, NC, NH, NJ, NY, OH, PA, PR, RI, SC, VA, VT, WV  
 EXTERIOR WALL PRODUCTS – STO

STO Products					
	DFT (mils)	VOC (g/l)	Perm	Min Temp°F	Elongation
<b>Masonry and Wall Products</b>					
StoPrime® Block Surfacer HP	7.3-8.3	<100	28	40	--
Sto Primer Smooth	2.7	<100	40	40	--
StoColor® Lotusan®	2.6-3.6	<50	40	40	--
StoColor® Lastic	2.7	<50	--	40	450
StoColor® Acryl Plus	4.2-5.3	<50	25	40	306
Sto Clear Coat Sealer	1	<100	--	50*	--
Sto Prime Conditioner	1.0	<100	>40	40	--

EXTERIOR METAL PRODUCTS – STO

STO Products					
	DFT (mils)	VOC (g/l)	Perm	Min Temp°F	Elongation
<b>Metals</b>					
81825 StoPrime DTM	2.5-4.0	<100	--	50	--
81824 StoColor DTM Semi-gloss	2.0	<100	--	50	--
81863 StoColor DTM Gloss	2.0	<100	--	50	--

END OF PRODUCT SCHEDULES - EXTERIOR

3.19 PRODUCT AND SYSTEM SCHEDULES - INTERIOR

- A. Select products and systems by one of the following manufacturers among those scheduled below. Refer to the following Product Schedules to verify manufacturer’s recommended DFT.
- B. System Schedules for each manufacturer follow the Product Schedule.

<b>Interior Products by PPG Paints</b>		
<b>Product Name</b>	<b>DFT (mils)</b>	<b>VOC (g/l)</b>
<b>Interior Metal</b>		
PPG Pitt-Tech Plus 4020 PF Acrylic DTM Primer	2.2	91
PPG Advantage 919-10 Gloss Acrylic Enamel	1.5	50
PPG Speed Hide 0 VOC Semi-Gloss Acrylic Enamel 6-5510 Series	1.3	0
PPG Speed Hide 0 VOC Eggshell Acrylic Enamel 6-5310 Series	1.5	0
PPG Super Tech Acrylic Flat Dryfall 6-725XI Series	2.2	30
PPG Rapid Coat DTR Epoxy Mastic 95-245 Series	4.0 -7.0	263
PPG Amerlock 400 VOC Semi-Gloss Epoxy	4.8-8.0	99
PPG Aquapon WB-E Ultra Low VOC Epoxy 98-E1 Series	2.0-3.0	26
PPG Pitt-Tech Gloss DTM Acrylic Enamel 90-1510 Series	2.0 – 3.0	192
<b>Interior CMU</b>		
PPG Pitt-Tech Plus 4020 PF Acrylic DTM Primer	1.5	0
PPG Speed Hide 0 VOC Eggshell Acrylic Enamel 6-5310 Series	1.7	0
PPG Speed Hide Block Filler 6-15XI Series	8.0	50
PPG Speed Hide 0 VOC Primer 6-4900XL	1.4	0
PPG Seal Grip Acrylic Primer 17-921XI Series	1.6	50
<b>Interior Gypsum Board</b>		
PPG Speed Hide 0 VOC Primer 6-4900XL	1.4	0
PPG Advantage 919-10 Gloss Acrylic Enamel	1.5	50
PPG Speed Hide 0 VOC Semi-Gloss Acrylic Enamel 6-5510 Series	1.3	0
PPG Speed Hide 0 VOC Eggshell Acrylic Enamel 6-5310 Series	1.5	0
<b>Interior Wood</b>		
PPG Speed Hide 0 VOC Primer 6-4900XL	1.4	0
PPG Seal Grip Acrylic Primer 17-921XI Series	1.6	50
PPG Speed Hide 0 VOC Semi-Gloss Acrylic Enamel 6-5510 Series	1.6	0
PPG Deft Sanding Sealer DFT015 Clear	1.0	590
<b>Interior Concrete Floors</b>		
PPG Amerlock 400 VOC Semi-Gloss Epoxy	4.8-8.0	99
PPG Breakthrough V72 Series Gloss Acrylic	1.5-2.0	211

<b>Interior Systems by PPG Paints</b>			
		<b>Prime Coat</b>	<b>Finish Coat(s)</b>
<b>Interior Ferrous Metal</b>			
INT 1	General Use – Gloss (unless specified otherwise)	Pitt-Tech Plus 4020PF Acrylic DTM Primer	2 coats: Advantage 919-10 Series Gloss Acrylic Enamel
INT 2	General Use – Semi-Gloss (unless specified otherwise)	Pitt-Tech Plus 4020PF Acrylic DTM Primer	2 coats: Speed Hide 0 VOC Semi-Gloss Enamel 6-5510 Series
INT 3	General Use – Eggshell (unless specified otherwise) -	Pitt-Tech Plus 4020PF Acrylic DTM Primer	2 coats: Speed Hide 0 VOC Eggshell Enamel 6-5310 Series

			Exception: Interior columns shall receive only one finish coat.
INT 4	Dryfall system over shop primed steel –overhead structure - Flat	To touch up prime welds, bare spots, blemishes, and scratches:	1 coat: Speed Hide Super Tech Flat Acrylic Dry fall 6-725XI
INT 5	Dryfall system over unprimed steel - overhead structure – Flat	Pitt-Tech Plus 4020PF Acrylic DTM Primer	1 coat: Speed Hide Super Tech Flat Acrylic Dry fall 6-725XI
INT 6	Columns and Hollow Metal Door Frames as shown on Drawings to receive epoxy – Semi-Gloss	PPG Amerlock 400 VOC Semi-Gloss Epoxy	1 coat: PPG Aquapon WB-E Ultra Low VOC Epoxy 98-E1 Series
INT 6 (CA)	Columns and Hollow Metal Door Frames as shown on Drawings to receive epoxy - Semi-Gloss	PPG Amerlock 400 VOC Semi-Gloss Epoxy	1 coat: PPG Aquapon WB-E Ultra Low VOC Epoxy 98-E1 Series
<b>Interior Galvanized Metal</b>			
INT 7	Latex for exposed ductwork, hangers, and supports – Semi-Gloss	Pitt-Tech Plus 4020PF Acrylic DTM Primer	2 coats: Speed Hide 0 VOC Semi-Gloss Enamel 6-4510XI Series
INT 8	Dryfall System for exposed ductwork, hangers and supports - Flat	Pitt-Tech Plus 4020PF Acrylic DTM Primer	1 coat: Speed Hide Super Tech Flat Acrylic Dryfall 6-725XI
INT 9	Cooler/Freezer Panels (Existing) - shown to be re-painted - Gloss	Pitt-Tech DTM Gloss Acrylic 90-374 Series	1 coat: Pitt-Tech DTM Gloss Acrylic 90-1510 Series
<b>Interior CMU – New Construction</b>			
INT 10	Latex System - Gloss	Speed Hide Acrylic Block Filler 6-15XI	2 coats: Advantage 919-10 Series Gloss Acrylic Enamel
INT 11	Latex System - Eggshell	Speed Hide Acrylic Block Filler 6-15XI	2 coats: Speed Hide 0 VOC Eggshell Enamel 6-5310 Series
<b>Interior CMU – Previously Painted</b>			
INT 12	Latex System - Gloss	Seal Grip Acrylic Primer 17-921XI Series (spot prime)	2 coats: Advantage 919-10 Series Gloss Acrylic Enamel
INT 13	Latex System - Eggshell	Seal Grip Acrylic Primer 17-921XI Series (Spot Prime)	2 coats: Speed Hide 0 VOC Eggshell Enamel 6-5310 Series
<b>Interior Gypsum Board</b>			
INT 14	Latex System - Gloss	Speed Hide 0 VOC Primer Sealer 6-4900XI	2 coats: Advantage 919-10 Series Gloss Acrylic Enamel
INT 15	Latex System – Semi- Gloss	Speed Hide 0 VOC Primer Sealer 6-4900XI	2 coats: Speed Hide 0 VOC Semi-Gloss Enamel 6-5510 Series
INT 16	Latex System - Eggshell	Speed Hide 0 VOC Primer Sealer 6-4900XI	2 coats: Speed Hide 0 VOC Eggshell Enamel 6-5310 Series

<b>Interior Wood</b>			
INT 17	General Use – Latex – Semi-Gloss	Speed Hide 0 VOC Primer Sealer 6-4900XI	2 coats: Speed Hide 0 VOC Semi-Gloss Enamel 6-5510 Series
INT 18	Exposed laminated wood roof structure – Latex – Semi-Gloss	Seal Grip Acrylic Primer 17-921XI Series	2 coats: Speed Hide 0 VOC Semi-Gloss Enamel 6-5510 Series
INT 19	Transparent sealer	PPG –Deft Sanding Sealer DFT015	---

<b>Interior Concrete Floors</b>			
INT 20	Floor, and floor striping, graphics and markings - Semi-Gloss	PPG Amerlock 400 VOC Semi-Gloss Epoxy	2 coats: PPG Amerlock 400 VOC Semi-Gloss Epoxy
INT 21	Existing Painted Floor Slabs – Semi-Gloss	PPG Breakthrough V70 Series	2 coats: PPG Breakthrough V72 Series

**Interior Products by Benjamin Moore**

Product	DFT (mils)	VOC (g/l)
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**Interior Metal**

Ultra Spec® HP Acrylic Metal Primer HP04	2.0	48
Ultra Spec® HP D.T.M. Acrylic Gloss Enamel HP28	2.3	142
Super Hide® Zero VOC Interior Latex Semi-Gloss 358	1.2	0
Super Hide® Zero VOC Interior Latex Eggshell 357	1.3	0
Latex Dry Fall Flat 395	1.9	46
Corotech Polyamide Epoxy Primer V150	4.0	332
Corotech Epoxy Mastic Coating V160	4.6-7.2	184
Corotech Waterborne Amine Epoxy V440	1.5-1.9	206
Ultra Spec® HP D.T.M. Acrylic Gloss Enamel HP28	2.3	142

**Interior CMU**

Ultra Spec® HP D.T.M. Acrylic Gloss Enamel HP28	2.3	142
Super Hide® Zero VOC Interior Latex Eggshell 357	1.3	0
Coronado Super Kote 5000® Latex Block Filler 958	7.9-10.5	37
Super Hide® Zero VOC Interior Latex Primer 354	1.4	0

**Interior Gypsum Board**

Super Hide® Zero VOC Interior Latex Primer 354	1.3	0
Ultra Spec® HP D.T.M. Acrylic Gloss Enamel HP28	2.3	142
Super Hide® Zero VOC Interior Latex Semi-Gloss 358	1.2	0
Super Hide® Zero VOC Interior Latex Eggshell 357	1.3	0

**Interior Wood**

Ultra Spec® 500 Interior Latex Primer N534	1.4	0
Insl-x® Prime All™ Multi-Surface Latex Primer Sealer AP-1000	1.3	29
Super Hide® Zero VOC Interior Latex Semi-Gloss 358	1.2	0

**Interior Concrete Floors**

Corotech Epoxy Mastic Coating V160	4.6-7.2	184
Tough Shield® Acrylic Floor and Patio Coating Satin Finish TS-3xxx	1.3-1.7	169

**Interior Systems by Benjamin Moore**

	Prime Coat	Finish Coat(s)
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**Interior Ferrous Metal**

INT 1	General Use – Gloss (unless specified otherwise)	Ultra Spec® HP Acrylic Metal Primer HP04	2 coats: Ultra Spec® HP D.T.M. Acrylic Gloss Enamel HP28
INT 2	General Use – Semi-Gloss (unless specified otherwise)	Ultra Spec® HP Acrylic Metal Primer HP04	2 coats: Super Hide® Zero VOC Interior Latex Semi-Gloss 358

INT 3	General Use – Eggshell (unless specified otherwise)	Ultra Spec® HP Acrylic Metal Primer HP04	2 coats: Super Hide® Zero VOC Interior Latex Eggshell 357
INT 4	Dryfall system over shop primed steel –overhead structure – Flat		1 coat: Latex Dry Fall Flat 395
INT 5	Dryfall system over unprimed steel - overhead structure – Flat	Ultra Spec® HP Acrylic Metal Primer HP04	1 coat: Latex Dry Fall Flat 395
INT 6	Columns and Hollow Metal Door Frames as shown on Drawings to receive epoxy – Semi-Gloss	Corotech Polyamide Epoxy Primer V150	1 coat: Corotech Waterborne Amine Epoxy V440
INT 6 (CA)	Columns and Hollow Metal Door Frames as shown on Drawings to receive epoxy - Semi-Gloss	Corotech Polyamide Epoxy Primer V150	1 coat: Corotech Acrylic Epoxy V450 Semi-gloss
<b>Interior Galvanized Metal</b>			
INT 7	Latex for exposed ductwork, hangers, and supports – Semi-Gloss	Ultra Spec® HP Acrylic Metal Primer HP04	2 coats: Super Hide® Zero VOC Interior Latex Semi-Gloss 358
INT 8	Dryfall System for exposed ductwork, hangers and supports - Flat	Ultra Spec® HP Acrylic Metal Primer HP04	1 coat: Latex Dry Fall Flat 395
INT 9	Cooler/Freezer Panels (Existing) - shown to be re-painted - Gloss		1 coat: Ultra Spec® HP D.T.M. Acrylic Gloss Enamel HP28
<b>Interior CMU – New Construction</b>			
INT 10	Latex System - Gloss	Coronado Super Kote 5000® Latex Block Filler 958	2 coats: Ultra Spec® HP D.T.M. Acrylic Gloss Enamel HP28
INT 11	Latex System - Eggshell	Coronado Super Kote 5000® Latex Block Filler 958	2 coats: Super Hide® Zero VOC Interior Latex Eggshell 357
<b>Interior CMU – Previously Painted</b>			
INT 12	Latex System - Gloss	Insl-x® Prime All™ Multi-Surface Latex Primer Sealer AP-1000	2 coats: Ultra Spec® HP D.T.M. Acrylic Gloss Enamel HP28
INT 13	Latex System - Eggshell		2 coats: Super Hide® Zero VOC Interior Latex Eggshell 357
<b>Interior Gypsum Board</b>			
INT 14	Latex System - Gloss	Super Hide® Zero VOC Interior Latex Primer 354	2 coats: Ultra Spec® HP D.T.M. Acrylic Gloss Enamel HP28
INT 15	Latex System – Semi- Gloss	Super Hide® Zero VOC Interior Latex Primer 354	2 coats: Super Hide® Zero VOC Interior Latex Semi-Gloss 358
INT 16	Latex System - Eggshell	Super Hide® Zero VOC Interior Latex Primer 354	2 coats: Super Hide® Zero VOC Interior Latex Eggshell 357
<b>Interior Wood</b>			
INT 17	General Use – Latex – Semi-Gloss	Ultra Spec® 500 Interior Latex Primer N534	2 coats: Super Hide® Zero VOC Interior Latex Semi-Gloss 358

INT 18	Exposed laminated wood roof structure – Latex – Semi-Gloss	Insl-x® Prime All™ Multi-Surface Latex Primer Sealer AP-1000	2 coats: Super Hide® Zero VOC Interior Latex Semi-Gloss 358
<b>Interior Concrete Floors</b>			
INT 10	Floor, and floor striping, graphics and markings - Semi-Gloss		2 coats: Corotech Epoxy Mastic Coating V160
INT 21	Existing Painted Floor Slabs – Semi-Gloss		2 coats: Tough Shield® Acrylic Floor and Patio Coating Satin Finish TS-3xxx

<b>Interior Products by Sherwin Williams</b>		
<b>Product Name</b>	<b>DFT (mils)</b>	<b>VOC (g/l)</b>
<b>Interior Metal</b>		
ProCryl Universal Primer B66-310	2.0	100
Pro Mar 200 Interior Latex Gloss Enamel, B21W200	1.5	143
ProMar 200 Zero VOC Interior Latex Semi-Gloss Enamel, B31- 2600 Series	1.6	0
ProMar 200 Zero VOC Interior Latex Eggshell Enamel, B20-2600 Series	1.7	0
Waterborne Acrylic Dryfall, B42 Series	2.0	39
Epolon II Rust Inhibitive Epoxy Primer B67W400, B67A400, B67A400	4.0	300
Macropoxy 646- 100, B58W620, B58V620	5.0-10.0	100
WB Acrolon 100 Water Based Urethane B65-720, B65V720	2.0-4.0	<100
DTM Acrylic Coating B66-100 Series	2.5-4.0	<250
<b>Interior CMU</b>		
Pro Mar 200 Interior Latex Gloss Enamel, B21W200	1.5	143
ProMar 200 Zero VOC Interior Latex Eggshell, B202-2600 Series	1.7	0
Loxon Concrete and Masonry Primer, A24W08300	3.0	45
ProMar 200 Zero VOC Latex Primer, B28W02600	1.5	0
<b>Interior Gypsum Board</b>		
ProMar 200 Zero VOC Latex Primer, B28W02600	1.5	0
Pro Mar 200 Interior Latex Gloss Enamel, B21W200	1.5	143
ProMar 200 Zero VOC Interior Latex Semi-Gloss Enamel, B31-2600 Series	1.6	0
ProMar 200 Zero VOC Interior Latex Eggshell, B202-2600 Series	1.7	0
<b>Interior Wood</b>		
ProMar 200 Zero VOC Latex Primer, B28W02600	1.5	0
PrepRite ProBlock Interior/Exterior Latex Primer Sealer B51 Series	1.4	97
ProMar 200 Zero VOC Interior Latex Semi-Gloss Enamel, B31-2600 Series	1.6	0
Wood Classics Varnish Sanding Sealer, B26V43	1.2	522
<b>Interior Concrete Floors</b>		
Macropoxy 646-100, B58W620, B58V620	5.0-10.0	<100
Armorseal Tread-Plex, B90 Series	1.5-2.0	<100

<b>Interior Systems by Sherwin Williams</b>		
	<b>Prime Coat</b>	<b>Finish Coat(s)</b>
<b>Interior Ferrous Metal</b>		
INT 1	General Use – Gloss (unless specified otherwise)	ProCryl Universal Primer B66-310 2 coats: Pro Mar 200 Interior Latex Gloss Enamel, B21W200*
INT 2	General Use – Semi-Gloss (unless specified otherwise)	ProCryl Universal Primer B66-310 2 coats: ProMar 200 Zero VOC Interior Latex Semi-Gloss Enamel, B31-2600 Series

INT 3	General Use – Eggshell (unless specified otherwise)	ProCryl Universal Primer B66-310	2 coats: ProMar 200 Zero VOC Interior Latex Eggshell Enamel, B20-2600 Series  Exception: Interior columns shall receive only one finish coat.
INT 4	Dryfall system over shop primed steel –overhead structure - Flat	To touch up prime welds, bare spots, blemishes, and scratches: ProCryl Universal Primer B66-310	1 coat: SW-eWaterborne Acrylic Dryfall, B42 Series
INT 5	Dryfall system over unprimed steel - overhead structure – Flat	ProCryl Universal Primer B66-310	1 coat: Waterborne Acrylic Dryfall, B42 Series
INT 6	Columns and Hollow Metal Door Frames as shown on Drawings to receive epoxy – Semi-Gloss	Epolon II Rust Inhibitive Epoxy Primer B67W400, B67A400, B67A400	1 coat: WB Acrolon 100 Water Based Urethane B65-720, B65V720
INT 6 (CA)	Columns and Hollow Metal Door Frames as shown on Drawings to receive epoxy - Semi-Gloss	Macropoxy 646- 100, B58W620, B58V620	1 coat: WB Acrolon 100 Water Based Urethane B65-720, B65V720
<b>Interior Galvanized Metal</b>			
INT 7	Latex for exposed ductwork, hangers, and supports – Semi-Gloss	ProCryl Universal Primer B66-310**	2 coats: ProMar 200 Zero VOC Interior Latex Semi-Gloss Enamel, B31-2600 Series
INT 8	Dryfall System for exposed ductwork, hangers and supports - Flat	ProCryl Universal Primer B66-310**	1 coat: Waterborne Acrylic Dryfall, B42 Series
INT 9	Cooler/Freezer Panels (Existing) - shown to be re-painted - Gloss	DTM Acrylic Coating B66-100 Series	1 coat: DTM Acrylic Coating B66-100 Series
<b>Interior CMU – New Construction</b>			
INT 10	Latex System - Gloss	Loxon Concrete and Masonry Primer, A24W08300	2 coats: Pro Mar 200 Interior Latex Gloss Enamel, B21W200*
INT 11	Latex System - Eggshell	Loxon Concrete and Masonry Primer, A24W08300	2 coats: ProMar 200 Zero VOC Interior Latex Eggshell Enamel, B20-2600 Series
<b>Interior CMU – Previously Painted</b>			
INT 12	Latex System - Gloss	ProMar 200 Zero VOC Latex Primer, B28W02600	2 coats: Pro Mar 200 Interior Latex Gloss Enamel, B21W200*
INT 13	Latex System - Eggshell	ProMar 200 Zero VOC Latex Primer, B28W02600	2 coats: ProMar 200 Zero VOC Interior Latex Eggshell Enamel, B20-2600 Series
<b>Interior Gypsum Board</b>			
INT 14	Latex System - Gloss	ProMar 200 Zero VOC Latex Primer, B28W02600	2 coats: Pro Mar 200 Interior Latex Gloss Enamel, B21W200*
INT 15	Latex System – Semi- Gloss	ProMar 200 Zero VOC Latex Primer, B28W02600	2 coats: ProMar 200 Zero VOC Interior Latex Semi-Gloss Enamel, B31-2600 Series

INT 16	Latex System - Eggshell	ProMar 200 Zero VOC Latex Primer, B28W02600	2 coats: ProMar 200 Zero VOC Interior Latex Eggshell Enamel, B20-2600 Series
<b>Interior Wood</b>			
INT 17	General Use – Latex – Semi-Gloss	ProMar 200 Zero VOC Latex Primer, B28W02600	2 coats: ProMar 200 Zero VOC Interior Latex Semi-Gloss Enamel, B31-2600 Series
INT 18	Exposed laminated wood roof structure – Latex – Semi-Gloss	PrepRite ProBlock Interior/Exterior Latex Primer Sealer B51 Series	2 coats: ProMar 200 Zero VOC Interior Latex Semi-Gloss Enamel, B31-2600 Series
INT 19	Transparent sealer	Wood Classics Varnish Sanding Sealer, B26V43	---
<b>Interior Concrete Floors</b>			
INT 20	Floor, and floor striping, graphics and markings - Semi-Gloss	Macropoxy 646- 100, B58W620, B58V620	2 coats: Macropoxy 646- 100, B58W620, B58V620
INT 21	Existing Painted Floor Slabs – Semi-Gloss	Armorseal Tread-Plex, B90 Series	2 coats: Armorseal Tread-Plex, B90 Series

\* Use for all states except CA. For CA projects, consult Manufacturer's Representative for compliant coating.

\*\* Apply primer after light etching is accomplished in accordance with Galvanized Steel – Interior Surface Prep requirements in Part 3 above.

END OF COATING SYSTEMS SCHEDULES - INTERIOR

END OF SECTION



## SECTION 10146 – EXTERIOR SIGNAGE

## PART 1 - GENERAL

## 1.1 SUMMARY

## A. Section Includes:

1. Owner furnished exterior building wall mounted signage for installation by Contractor, including:
  - a. Illuminated or non-illuminated channel dimensional letter signs.
  - b. Illuminated or non-illuminated panel signs.
2. Owner furnished exterior site signage for installation by Contractor, including:
  - a. Illuminated or non-illuminated free-standing monument, pylon, or post and panel signs.

## B. Related Requirements:

1. Section 09900 – Paints and Coatings: Field painting of canopy columns, components, and other miscellaneous supporting steel sign structures as shown on Drawings when color rebranding is included in project.

## 1.2 DELIVERY, STORAGE AND HANDLING

- A. Product Delivery: Deliver signs to site on or near the day scheduled for sign installation.
- B. If required to receive or store signs and equipment prior to scheduled installation, comply with the requirements of Section 01600 and sign manufacturer's recommendations.

## 1.3 SEQUENCING, SCHEDULING, AND COORDINATION

- A. Immediately after Award of Contract, Contact the preselected Sign Contractor for project to coordinate permitting and installation schedules.
- B. Assigned Sign Contractor is as follows:
  1. Company Name: **Advance Signs & Service**
  2. Point of Contact Name: **Scott Brown**
  3. Street, State and Zip Code Address: **596 W. Church St., Angier, NC. 27501**
  4. Telephone(s): **919-639-4666**
  5. Contact email address(es): **scott.brown@advansignservice.com**

## PART 2 - PRODUCTS

## 2.1 OWNER FURNISHED PRODUCTS

- A. Owner furnished signs and appurtenant installation equipment and materials are supplied by the preselected Sign Contractor.

## PART 3 - EXECUTION

## 1.1 EXAMINATION

- A. Examine existing conditions to verify completion of prerequisite work including vinyl graphic film wrap and paint work on canopies and other substrate prior to start of sign installation.

## 1.2 INSTALLATION

- A. Install signs at locations shown on Drawings in accordance with manufacturer's recommendations.

END OF SECTION

10146-1

## SECTION 10160 - METAL TOILET COMPARTMENTS

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Work Includes:
  - 1. Owner furnished floor mounted and head rail braced stainless steel toilet compartments and screens for installation by Contractor.
- B. Related Requirements: The following list is intended to aid in locating products and work related to or dependent on the scope in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
  - 1. Section 06100 - Rough Carpentry: Framing and plates within walls.
  - 2. Section 10810 - Toilet Accessories: Coordinate compartment installation with subsequent accessory installation.
  - 3. Appendix A – Products and Work by Owner or Separate Contractor: Manufacturers, suppliers, product information, installation (if applicable), and general procedures related to Owner furnished products.

## 1.2 REFERENCES

- A. American National Standards Institute (ANSI): ANSI A117.1 - Specification for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People.
- B. Americans with Disabilities Act (ADA), ADA-ADAAGS - 2010 ADA Standards for Accessible Design.
- C. State and local disabled accessibility requirements and guidelines.

## 1.3 SUBMITTALS

- A. Process for the following submittal is specific to the scope of this Section. Comply with the submittal requirements herein with respect to format and manner of submission, notwithstanding the Process and Responsibilities requirements specified in Part 1 of Section 01330.
- B. Submit a Restroom Partition Field Verification Template to the pre-selected Supplier as follows:
  - 1. Follow [www.hjcinc.com/tpdems.pdf](http://www.hjcinc.com/tpdems.pdf) to locate the Verification Template PDF.
  - 2. Complete the Verification Template with the information required and return to Supplier as prompted by the smart message link on the face of the Verification Template form.
  - 3. Verify ADA clearances are maintained between toilet partitions and any room fixture.

## 1.4 DELIVERY, STORAGE AND HANDLING

- A. Transport, handle, store, and protect products in compliance with the requirements of Section 01600 and manufacturer's recommendations.
- B. Product Packaging: Products be shipped in manufacturer's standard packaging with identification markings on each component or package.
- C. Receive Owner Furnished products in accordance with the requirements of Section 01600.
  - 1. Product Delivery: Owner's Supplier will deliver Owner furnished products to site to be received by Contractor. Contact Owner's Suppliers to coordinate delivery of Owner furnished products and materials.
- D. Product Compliance Inspection: Inspect delivered products for compliance with product descriptions in Part 2 herein. Report discrepancies to the Architect.

10160-1

## PART 2 - PRODUCTS

### 2.1 OWNER FURNISHED PRODUCTS

- A. Owner's Supplier will furnish metal toilet compartments as specified in Appendix A (Section 10160) for installation by Contractor.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Take site dimensions prior to fabrication of any items. Verify correct spacing of plumbing fixtures.
- B. Verify correct location of built-in framing, anchorage, and bracing.

### 3.2 INSTALLATION

- A. Install partitions secure, rigid, plumb, level, and square. Secure units in position with manufacturer's anchoring devices and in accordance with manufacturer's instructions.
  - 1. Provide for adjustment due to minor floor variations.
  - 2. Install adjacent components for consistency of line and plane.
- B. Maintain minimum 1/2 inch space between wall and panels, and between wall and pilasters.
- C. Attach panels and pilasters to bracket with through sleeve, tamperproof bolts, and nuts.
- D. Install headrail in accordance with manufacturer's drawings and locate head rail joints at centerline of pilaster.
- E. Anchor urinal screen panels to walls with brackets in accordance with manufacturer's instructions to suit supporting wall construction.
- F. Attach panel brackets securely to walls using anchor devices.
- G. Conceal floor fastenings at pedestals.
- H. Equip each door with hinges, one door latch and one coat hook and bumper. Align hardware to uniform clearance at vertical edges of doors, not exceeding 1/4 inch. Install privacy strips in accordance with manufacturer's written instructions.
- I. Install pull handles on both sides of toilet partition doors for handicapped and ambulatory stalls.

### 3.3 ADJUSTING

- A. In Swinging Doors: Adjust hinges to hold doors in partially open position when unlatched.
- B. Out Swinging Doors: Adjust hinges to gently return doors to closed position.

### 3.4 CLEANING

- A. Protection and Cleaning of Stainless Steel Toilet Compartments and Screens Prior to Possession
  - 1. Remove protective plastic coating from stainless steel partitions. Remove any residue from the plastic coating with mild soap and water.
  - 2. Caution: Muriatic acid or other caustic chemicals shall not be used to clean stainless steel products. Muriatic acid for cleaning masonry or similar hydrochloric acid type cleaners must immediately be neutralized and scrubbed off with clean water if splashed, sprayed, spilled or otherwise in contact with a stainless steel component.

3. Immediately prior to possession, clean stainless steel toilet compartments and screens thoroughly using soap, ammonia, or mild detergent and water. Apply with sponge or soft cloth, rinse with clear water and wipe dry. Always rub in the direction of polish lines. Rinse thoroughly with fresh water after every cleaning operation. Clean and polish toilet partitions to a spotless luster. Wipe dry to avoid water marks.

END OF SECTION

## SECTION 10260 (10 2601) - WALL AND CORNER GUARDS

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Surface applied corner guards.
  - 2. Wall guards.
  - 3. Owner furnished tire stops for installation by Contractor.
  - 4. Owner furnished gondola shelf corner guards for installation by Contractor.
  - 5. Owner furnished floor mount refrigerated case protection for installation by Contractor.
  
- B. Related Requirements: The following list is intended to aid in locating work related to or dependent on the scope of Work in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
  - 1. Section 09310 – Ceramic Tile: Stainless steel corner trim installed with ceramic wall tile.
  - 2. Appendix A – Products and Work By Owner or Separate Contractor: Manufacturers, suppliers, vendor contacts, and general procedures related to Owner furnished products.

## 1.2 DELIVERY, STORAGE AND HANDLING

- A. Section 01600 - Product Requirements: Transport, handle, store, and protect Products.
  
- B. Owner Furnished Product Delivery: Owner's Supplier will deliver products to jobsite in manufacturer's standard identified packaging and ready for installation. Contractor shall contact to establish a product delivery and installation date and establish a coordination procedure.

## PART 2 - PRODUCTS

## 2.1 OWNER FURNISHED PRODUCTS

- A. Owner's supplier will furnish the following as specified in Appendix A (Section 10260) for installation by the Contractor:
  - 1. Rubber tire stops.
  - 2. High impact corner guards (EDPM and stainless steel).
  - 3. Diamond Plate Floor Mount Rail System for Refrigerated Case Protection.

## 2.2 MANUFACTURERS

- A. Provide guards by one of the following manufacturers as specified:
  - 1. American Floor Products Co., Inc., (800) 342-0424.
  - 2. InPro Corporation, Muskego, WI (800) 222-5556.
  - 3. McCue Corporation, Peabody, MA. Contact: Kaitlyn Roaf, (800) 800-8503, [kroaf@mccue.com](mailto:kroaf@mccue.com) or [cservices@mccue.com](mailto:cservices@mccue.com).
  - 4. Pawling Corporation, (800) 431-3456.
  - 5. Schluter Systems, Plattsburgh, NY (888) 472-4588.

## 2.3 PRODUCT SCHEDULE

- A. Corner Guards: Provide the following corner guard types if shown on Drawings.
  - 1. Clear Plastic:
    - a. Space (CG-2145) Invisible Corner Guard, clear, 1/8-inch thick, 2-1/2 inch wing, 48 inches high, by American Floor.

- b. Clear Polycarbonate Surface Mounted 90 Degree Corner Guards, 1/8-inch thick, (CG-18) 2-1/2 inch wing, 48 inches high, by Pawling.
- c. Fasteners: Flathead countersunk screws, length sufficient to penetrate substrate
- 2. Vinyl:
  - a. Electra (CG-2144) Corner Guard, 3/4 x 3/4 inches x 48 inches, by American Floor.
  - b. Surface Mounted Corner Guard (CG-34), 3/4 x 3/4 inches x 48 inches, by Pawling.
  - c. Color: Black.
  - d. Contact Adhesive: Adhesive VOC shall be not greater than 80 g/L as set forth in the California South Coast Air Quality Management District (SCAQMD) Rule No.1168. Provide one of the following:
    - 1) 3M Fastbond Adhesive, by 3M, St. Paul, MN (800) 362-3550.
    - 2) Other similar contact adhesive that is suitable for use with high pressure laminates.
- 3. Aluminum: Factory pre-drilled for installation with countersunk screws.
  - a. Polaris (CG-2139) Corner Guard, 18 gage, 1 x 1 inches x 48 inches, unless otherwise shown, by American Floor.
  - b. Aluminum Corner Guard, 0.08 inch thick, 1 x 1 inches x 48 inches, unless otherwise shown, by Pawling.
    - 1) CG-401, for 90° corners.
    - 2) CG-404, for 135° corners.
  - c. Aluminum Outside Corner Guard: 1 x 1 inches x 48 inches, satin finish aluminum corner guard as recommended by manufacturers of PS-7 and PS-11 protective surfacing specified in Section 06424, by American Floor or Pawling
- 4. Stainless Steel: 16 gage, 1-1/2 x 1-1/2 inches, unless otherwise shown.
  - a. ECK-K by Schluter.
  - b. Lunar CG-2143, Style L-1, by American Floor.
  - c. CG-51 by Pawling.
  - d. S181124C-304 by InPro.
  - e. Adhesive: Adhesive VOC shall be not greater than 80 g/L as set forth in the California South Coast Air Quality Management District (SCAQMD) Rule No.1168.
    - 1) KURDI-fix by Schluter.
    - 2) ADH-50 Adhesive by Pawling.
    - 3) Equivalent by other manufacturers or as recommended by the corner guard manufacturer.
- 5. Angle Steel Corner Guards: Angle steel corner guards applied to plywood wainscot shall be ASTM A36 structural steel angle, size as shown on Drawings.

## B. WALL GUARDS

- 1. Plastic Wall Guards (Supercenter) (Except Pharmacy): PVC bumper on PVC mounting base, 2" high x 12 ft long x 1-3/4" projection, color black. May be noted on drawings as "WG" or "bumper rail." Provide the following:
  - a. CartGuard E (CGT-175) bumper with base (CGB-175), including corners and end caps as required, by McCue Corporation.
- 2. Plastic Wall Guard (Site Built Pharmacy): Vinyl bumper cover on continuous aluminum retainer, 1-1/8" high x 12 ft long section x 1-1/8" projection, lightly pebbled or matte finish. Provide one of the following:
  - a. 200 Wall Guard by InPro.
  - b. Color: No. 0106 Dove Gray.
- 3. Accessories: End caps, outside corners, brackets, and fasteners as recommended by wall guard manufacturer.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates and wall areas, with installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
  - 1. Examine walls to which wall guards will be attached for blocking, grounds, and other solid backing that have been installed in the locations required for secure attachment of support fasteners.
  - 2. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Before installation, clean substrate to remove dust, debris, and loose particles.

### 3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions, square and plumb, secured rigidly in position.
  - 1. Position corner guard spaced above finished floor to allow for installation of wall base type specified or shown on Drawings. Coordinate installation of wall finishes with corner guard installation.
- B. Clear Plastic Corner Guards: Attach clear plastic corner guards at locations shown on Drawings with countersunk screw fasteners provided by the supplier in accordance with manufacturer's instructions.
- C. Aluminum Corner Guards:
  - 1. Locate aluminum corner guards at outside corners of protective surfacing wainscot and plastic laminate case-work and in sales areas accessible by public at other locations shown on the drawings, unless otherwise indicated or specified to receive other type of corner guards.
  - 2. Attach aluminum corner guards in accordance with corner guard manufacturer's written instructions.
- D. Stainless Steel Corner Guards:
  - 1. Locate stainless steel as shown on drawings.
  - 2. For top of base installation, attach stainless steel corner guards starting at top of base, unless otherwise shown, and set tight to wall with mastic adhesive.
  - 3. For installation at other locations, attach stainless steel corner guards as shown on Drawings.
- E. Diamond Plate Refrigerated Case Floor Mount Railing System:
  - 1. Remove existing case protection and corner guards, repair existing surfaces, and install new rail protection system in accordance with rail system manufacturer's instructions.
- F. Tire Stops:
  - 1. Locate tire stops at vestibule cart storage where shown on Drawings.
  - 2. Install tire stops at locations shown on Drawings and in accordance with manufacturer's written instructions.
- G. High Impact Corner Guards:
  - 1. Locate corner guards at overhead doorway at vestibule cart storage where shown on Drawings.
  - 2. Install high impact corner guards at base of overhead doorway on ingress and egress sides in accordance with manufacturer's written instructions.
- H. Wall Guards: Locate wall guards where shown on Drawings.

END OF SECTION

## SECTION 10736 (10 73 16) - METAL CANOPY

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Owner furnished engineered metal canopy system for installation by Contractor, including the following canopies:
    - a. Pickup associate walkway canopy.
    - b. .
    - c. Pharmacy vehicular drive-through canopy.
- B. Related Requirements: The following list of items is intended to aid in locating work related to or dependent on the scope of Work in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
  - 1. Section 09900 - Field painting of canopy columns, components, and other miscellaneous supporting steel structures as shown on Drawings.
  - 2. Section 16100 - Wiring Methods. Contractor provided electrical wiring.
  - 3. Appendix A – Products and Work by Owner or Separate Contractor: Manufacturers, suppliers, and vendor contacts and product names and numbers related to Owner furnished products.

## 1.2 DESIGN REQUIREMENTS

- A. Canopy foundation design shall be in accordance with the architectural and structural requirements shown on the Drawings.

## 1.3 SCHEDULING AND COORDINATION

- A. Contact Canopy Supplier after Award of Contract to establish canopy system delivery date.

## 1.4 SUBMITTALS

- A. Code Compliance Submittals: Drawings and calculations have been previously submitted to the Authority Having Jurisdiction for code compliance as supplementary information at the time of the permit application.

## 1.5 DELIVERY, STORAGE AND HANDLING

- A. Receive Owner Furnished products in compliance with the requirements of Section 01600.
- B. Unload Canopy Supplier's products and equipment from Canopy Supplier's transport vehicles.
- C. Product Packaging: Canopy components will be delivered in manufacturer's standard packaging with identification markings on each component or package.
- D. Acceptance at Site: Inspect products with Canopy Supplier upon delivery of products to Site.
  - 1. Verify quantity of products furnished.
  - 2. Report discrepancies in product quantity delivered, or damage to products delivered to Canopy Supplier and Owner immediately. Upon notification, Owner will arrange for delivery of replacement products.
- E. Handle, store, and protect products in compliance with the requirements of Section 01600 and manufacturer's recommendations.

## PART 2 - PRODUCTS



## 2.1 OWNER FURNISHED PRODUCTS

- A. Canopy: Owner's Canopy Supplier will furnish canopies and appurtenances as specified in Appendix A (Section 10736).

## 2.2 ACCESSORY PRODUCTS BY CONTRACTOR

- A. Steel Pipe Bollards: Provide exterior bollards and plastic bollard sleeves at locations shown on Drawings.
  - 1. Bollard: Removable or concrete filled footing mounted steel pipe bollards as specified in Section 05500.
  - 2. Bollard Sleeve: Thermoplastic polyethylene pipe sleeves for bollards as specified in Section 06065.

## PART 3 - EXECUTION

### 3.1 PREPARATION BY CONTRACTOR

- A. Verify footing construction and anchor bolt placement as shown on Drawings.
- B. Provide the following minimum site conditions for canopy erection:
  - 1. Free and clear access to the canopy installation site with no trenches, soil stockpiles or other obstructions in the area surrounding the canopy.
  - 2. Staging area for all job-related material.
  - 3. Dumpster for disposal and recycling of job-related debris.

### 3.2 INSTALLATION

- A. Install complete canopy system in accordance with canopy manufacturer's written instructions.
- B. Prepare site and building exterior wall, where required, for installation of canopy as shown on Drawings.
- C. Provide concrete footings as shown on Drawings.
- D. Provide electrical circuitry as shown on Drawings for Owner-furnished light fixtures. Install fixtures in accordance with manufacturer's written instructions.
- E. Erect canopy framing plumb, level, rigid, and secure as shown on Drawings.
- F. Provide non-shrinking grout under baseplates for uniform bearing and level elevation. Moist-cure grout for 7 days after placement.
- G. Provide weather tight mounting of gutters, downspouts, and other accessories.
- H. Repair damaged finishes so no evidence remains of corrective work. Return items that cannot be refinished in the field to the factory. Make required alterations and refinish entire unit or provide new.
- I. Protect galvanized and non-ferrous metal surfaces from corrosion or galvanic action by applying heavy coating of bituminous paint on surfaces that will be in contact with concrete, masonry, or dissimilar materials.
- J. Paint columns, components, and miscellaneous supporting steel structures as specified in Section 09900 in locations as shown on Drawings.

END OF SECTION

## SECTION 10810 - TOILET ACCESSORIES

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes: Owner furnished toilet accessories and attachment hardware for installation by Contractor.
- B. Related Requirements: The following list is intended to aid in locating products and work related to or dependent on the scope of this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
  - 1. Section 06100 - Rough Carpentry: Blocking for attachment of accessories.
  - 2. Appendix A – Products and Work by Owner or Separate Contractor: Manufacturers, suppliers, product information, installation (if applicable), and general procedures related to Owner furnished products.

## 1.2 REFERENCES

- A. The publications below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. American National Standards Institute (ANSI):
  - 1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.

## 1.3 DELIVERY, STORAGE AND HANDLING

- A. Transport, handle, store, and protect products in compliance with the requirements of Section 01600.
- B. Product Packaging: Products and equipment will be shipped in manufacturer's standard packaging with identification markings on each component or package.
- C. Receive Owner Furnished products in accordance with the requirements of Section 01600.
  - 1. Product Delivery: Owner's Supplier will deliver Owner furnished products to site to be received by Contractor. Contact Owner's Suppliers to coordinate delivery of Owner furnished products and materials.
- D. Product Compliance Inspection: Inspect delivered products for compliance with product descriptions in Part 2 herein. Report discrepancies to the Architect.

## PART 2 - PRODUCTS

## 2.1 OWNER FURNISHED PRODUCTS

- A. Owner's supplier will furnish toilet accessories as specified in Appendix A (Section 10810) for installation by the Contractor.

## 2.2 MATERIALS

- A. Adhesive: Epoxy type contact cement.
- B. Thread Lock Compound (For Coat Rack Fastener): Loctite 242, by Henkel.
- C. Provide installation fasteners and anchor components for equipment and accessories of the type required for substrate.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Verify components are properly shop-assembled and package is complete.
- B. Use templates and rough-in measurements as required for building into wall construction.
- C. Ensure that blocking is appropriately installed and ready to receive accessories.
- D. Rough Wall Openings: Provide rough wall opening (RWO) in compliance with ADA Accessibility Guidelines, as detailed on architectural drawings, and as described in the Schedule of Accessories.

### 3.2 INSTALLATION

- A. Install fixtures, accessories, and items in accordance with manufacturer's instructions and as shown on Drawings. Install accessories within toilet rooms and install soap dispensers in other areas in addition to toilet rooms where shown on the drawings. Use tamper-proof fasteners.
- B. Install true, plumb, and level, securely and rigidly anchored to wall framing.
- C. Install foot operated pulls on restroom doors where shown on the drawings. Install in accordance with manufacturer's instructions using the fasteners supplied by the door pull manufacturer. Install instructional decals on inside face of door above handle.
- D. Where blocking or framing is not properly located to receive grab bars in existing hollow walls that are not modified or scheduled to receive new finishes, install grab bars using specified hollow wall fasteners. Install fasteners in accordance with fastener manufacturer's recommendations, using hole saw recommended by fastener manufacturer for type of wall construction and finish encountered.
- E. Back paint components where contact is made with building finishes to prevent electrolysis.
- F. Install sealant around metal frames of mirrors, and all toilet accessories abutting FRP/NRP wall panels.

### 3.3 CLEANING

- A. Protection and Cleaning of Toilet Accessories and Attachment Hardware Prior to Possession.
  - 1. Immediately prior to possession, clean stainless steel accessories and attachment hardware thoroughly using soap, ammonia, or mild detergent and water. Apply with sponge or soft cloth, rinse with clear water and wipe dry. Always rub in the direction of polish lines. Rinse thoroughly with fresh water after every cleaning operation. Clean and polish to a spotless luster. Wipe dry to avoid water marks.
  - 2. Clean and polish stainless steel accessories and mirror surfaces to a spotless luster.

END OF SECTION

## SECTION 11141 – OIL AND FILTER WASTE CONTAINMENT DEVICES

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Waste oil storage tanks and oil filter waste containment devices furnished by Owner for installation Contractor-hired Certified Installer (CI).
- B. Related Requirements:
  - 1. Appendix A - Products and Work by Owner or Separate Contractor.
    - a. General procedures related to Owner furnished products.
    - b. Manufacturers, suppliers, vendor contacts and product names and numbers related to Owner furnished products.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. National Fire Protection Association (NFPA):
  - 1. NFPA 30 - Flammable and Combustible Liquids Code.
- C. General Contractor Permit, Registration, Notification, Inspection & Installer Certification (GC PRN) Report.
  - 1. Information furnished in the project GC PRN report shall not be used to modify requirements specified herein.
  - 2. GC PRN reports are available to Contractor within the GC Permit Information Folder on Owner's document delivery website.

## 1.3 SUBMITTALS

- A. Record Documents: Submit the following to Architect for review for compliance with requirements as installation of each respective item is completed and tested as required, but in no instance later than 60 days prior to possession. Submit copies of the same documents, with the Architect's stamp indicating review and acceptance, to Wal-Mart as Closeout Submittals prior to final payment in accordance with Section 01770.
  - 1. Certification of Installation: Statement by Certified Installer of verification of satisfactory installation.
  - 2. Inspection Reports.
  - 3. Operational Test Report.
  - 4. Operation and Maintenance Manuals.
  - 5. [Insert applicable document.]
  - 6. [Insert applicable document.]
  - 7. [Insert applicable document.]
  - 8. [Insert applicable document.]

## 1.4 QUALITY ASSURANCE

- A. Qualifications: Equipment Installer Qualifications shall conform to the following:
  - 1. Certification:
    - a. Waste oil storage tanks and bulk oil filter storage containers, to the extent indicated on the Equipment Schedule on the Drawings, shall be installed by an approved Certified Installer.
    - b. Existing waste oil storage tanks and bulk oil filter storage containers, shown on Drawings to be relocated or repositioned, shall be installed by an approved Certified Installer.
  - 2. General Contractor shall provide the requirements of this Section to the Certified Installer to make known to the installer, the necessary qualifications and stipulations.

3. General Contractor shall hire directly the Certified Installer to perform the work.

.The Authority Having Jurisdiction requires installation of Vehicle Service Equipment by an approved Certified Installer. Certified Installation requirements of an Authority Having Jurisdiction may supercede the requirements of a Vehicle Service Equipment supplier. Contact the Authority Having Jurisdiction for list(s) of Certified Installers:

1. Contact: [Insert AHJ contact information]
2. Equipment requiring installation by Certified Installer:
  - a. [Note applicable equipment.]
  - b. [Note applicable equipment.]
  - c. [Note applicable equipment.]
  - d. [Note applicable equipment.]

C. Regulatory Requirements:

1. Regulations: Equipment as described by this Section shall be installed to comply with Federal, State, and local regulatory agencies and environmental regulations including but not limited to those listed in the project GC PRN report.
2. Documentation: Obtain documents required by the Authority Having Jurisdiction or by Applicable Codes, including, but not limited to documents listed as follows:
  - a. Certification: Obtain statement by Certified Installer confirming installation complies with regulatory and environmental requirements and equipment and piping manufacturer's installation requirements.
  - b. Test Report: Compile and produce test reports specified in Part 3.
  - c. Refer to the project GC PRN report for additional Documentation requirements, if any.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Product Delivery: The Contractor shall contact all vehicle equipment suppliers after Award of Contract to establish a product delivery date, and installation date as applicable, and establish a coordination procedure.
- B. Product Packaging: Equipment will be delivered in manufacturer's standard packaging with identification markings on each component or package.
- C. Acceptance at Site: Receive products as specified in Section 01600.
  1. Inspect products with Supplier upon delivery of products to jobsite.
  2. Verify quantity of products furnished.
  3. Report discrepancies in product quantity delivered or damage to products delivered to Equipment Supplier and Wal-Mart immediately. Upon notification, Wal-Mart will arrange for delivery of replacement products.
- D. Manufacturing Defects: Report suspected manufacturing defects to Wal-Mart Construction Manager and Equipment Supplier. Upon notification, Wal-Mart will arrange for repair of manufacturing defects.
- E. Handle, store, and protect products in accordance with the provisions of Section 01600 - Product Requirements.

1.6 SCHEDULING

- A. Complete all inspections, submittals, and approvals within 48 hours of equipment installation as allowed by AHJ or regulatory agencies.

PART 2 - PRODUCTS

2.1 OWNER FURNISHED EQUIPMENT

- A. Owner's vehicle service equipment supplier will furnish DIY Waste Oil Storage Tank and Bulk Oil Filter Storage Container as scheduled on the drawings and as specified in Appendix A (Section 11141).

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Installation shall be as scheduled on the drawings. Equipment shall be installed in accordance with manufacturer's published instructions, NFPA 30, and regulatory requirements specified in this section.
  - 1. New equipment identified on the Drawings shall be installed by a Certified Installer.
  - 2. Existing equipment identified on Drawings to be relocated or repositioned shall be installed by a Certified Installer.

3.2 FIELD QUALITY CONTROL

- A. Installation Inspection: Upon completion of installation, Contractor and the Installer of each respective piece of equipment, whether new, relocated or repositioned, shall make final inspection(s) and tests specified hereinafter to verify installation is in accordance with specified requirements. Prepare Statement of Verification of Satisfactory Installation signed by Contractor and Installer.
- B. Upon completion of installation and inspections, conduct operational tests on equipment to ensure proper operation.
- C. Test equipment in accordance with all applicable National, State, and local codes and with manufacturer's instructions and recommendations.
  - 1. Final Tank Leakage Testing: After installation, perform in-place tank leakage test on storage tanks shown on Drawings. If required, testing shall be performed in presence of AHJ.

END OF SECTION

## SECTION 11400 - FOOD SERVICE EQUIPMENT

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Food service equipment furnished by Owner for installation by either Owner or Contractor as indicated in Equipment Schedule on Drawings.
  - 2. Equipment final connections.
- B. Related Requirements:
  - 1. Section 15600 - Refrigeration Equipment: Connections to refrigeration systems.
  - 2. Section 16100 - Wiring Methods: Connections to electrical systems.
  - 3. Appendix A - Products and Work by Owner or Separate Contractor: General procedures, manufacturers, suppliers, vendor contacts, and product information for products and services by Owner.

## 1.2 REFERENCES

- A. General Contractor Permit, Registration, Notification, Inspection & Installer Certification (GC PRN) Report.
  - 1. Information furnished in the project GC PRN report shall not be used to modify requirements specified herein.
  - 2. GC PRN reports are available to Contractor within the GC Permit Information Folder on Owner's document delivery website.

## 1.3 DELIVERY, STORAGE AND HANDLING

- A. Receive, unload and store Owner furnished equipment, as indicated in Equipment Schedule on Drawings, in a location that will not interfere with orderly completion of work. Protect equipment from damage.
- B. Transport equipment not in crates by hand only.
- C. Set Owner furnished equipment as indicated in Equipment Schedule and on Drawings.

## 1.4 COORDINATION

- A. Owner's equipment supplier will contact Contractor after Award of Contract to establish a product delivery and installation date and establish a coordination procedure.
- B. Unload Owner furnished equipment. Follow instructions on packaging, when provided, for proper handling and care while unloading and moving equipment.
- C. Coordinate with supplier so that equipment necessary for unloading (provided by Contractor) is available to unload equipment from truck and place into position.

## 1.5 QUALITY ASSURANCE

- A. Regulatory Requirements:
  - 1. Regulations: Equipment and piping as described by this Section shall be installed to comply with Federal, State, and local regulatory agencies and environmental regulations including but not limited to those listed in the project GC PRN report.
  - 2. Documentation: Obtain documents required by the Authority Having Jurisdiction or by Applicable Codes, including, but not limited to documents listed as follows:
    - a. Certification: Provide statement confirming installation complies with regulatory and environmental requirements and equipment manufacturer's installation requirements.

- b. Refer to the project GC PRN report for additional Documentation requirements, if any.

## PART 2 - PRODUCTS

### 2.1 OWNER FURNISHED EQUIPMENT

- A. Owner's food service supplier will furnish food service equipment as specified in Appendix A (Section 11400) for installation by either Owner or Contractor as indicated in Equipment Schedule on Drawings.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Make shop drawings and manufacturer's rough-in requirements available to everyone involved.
- B. Verify that mechanical, plumbing, and electrical rough-ins have been properly located.
- C. Obtain necessary drawings, manufacturer's product data, and other data to provide a complete and proper installation.
- D. Check field dimensions prior to installing equipment. Verify necessary clearances and means of access from equipment storage to final position.
- E. Provide two skilled laborers to work for a period of three days, exclusively to assist in Bakery unload, set up, and clean up.
- F. Provide two skilled laborers to work for a period of three days, exclusively to assist in Rotisserie unload, set up, and clean up.
- G. Provide the following equipment during set up: One forklift, four 4-wheel dollies, one Johnson bar.

### 3.2 INSTALLATION

- A. Uncrate and set equipment in place plumb, level, and properly secured.
- B. Equipment installation shall be by Owner or Contractor as scheduled on the drawings. Installation shall be in accordance with manufacturer's requirements and installation instructions, unless otherwise indicated on Drawings.
- C. Final Connections: Contractor shall perform final mechanical, plumbing, and/or electrical connections as required and recommended by manufacturer.

### 3.3 FIELD QUALITY CONTROL

- A. Field quality control shall be the responsibility of the Contractor in accordance with Section 01452. Except for testing specified as mandatory, field quality control testing and inspection shall be at the discretion of the Contractor as necessary to assure compliance with Contract requirements.
- B. Mandatory Testing by Contractor:
  - 1. Conduct operational tests of equipment through full operational cycle and operate for a sufficient time to verify that equipment is operating within manufacturer's specifications. General Contractor shall provide support when adjustments or changes are necessary.
  - 2. Manufacturer's representative or supplier shall conduct operational on-site tests on their equipment as specified in Appendix A.
  - 3. General Contractor shall conduct operational tests of the following items in lieu of testing by manufacturer.
    - a. Three compartment stainless steel sinks.
    - b. Stainless steel hand sinks.
    - c. Reverse osmosis water system.



4. Complete operational tests no later than one week after completion of Date of Possession.

3.4 OWNER TESTING AND INSPECTION (T&I)

- A. The Owner's equipment supplier or manufacturer will perform testing and inspection (T & I). as specified in Appendix A (Section 11400).
- B. Contractor's Responsibility: Provide adjustments or changes as required from operation test results.

3.5 CLEANING

- A. Remove tape, wrapping, packing and such items used to facilitate shipping and handling from equipment.
- B. Remove and assemble product data, except permanent labels and plates, and present to Owner.
- C. Remove packing and shipping materials from site.
- D. Clean equipment with materials as specifically recommended by equipment manufacturer.

END OF SECTION

## SECTION 13030 – PHARMACY MODULAR BUILDING COMPONENTS

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section includes Modular Pharmacy pre-fabricated, off-site constructed building systems furnished by Owner and installed by Owner or Contractor as specified or as shown on Drawings.
- B. Related Requirements:
  - 1. Section 06400 – Architectural Woodwork: Modular pharmacy millwork/casework and appurtenant equipment and accessories.
  - 2. Appendix A - Products and Work by Owner or Separate Contractor: General procedures, manufacturers, suppliers, vendor contacts, and product information for products and services by Owner.
    - a. Item List and Responsibility Schedules for Primary and Temporary Modular Packages.

## 1.2 ADMINISTRATIVE REQUIREMENTS

- A. Pre-Installation Conference:
  - 1. Coordinate a pre-installation conference at the jobsite three weeks prior to Pharmacy construction start date. Require attendance of all parties responsible for Pharmacy construction work, or affected by it, including but not limited to contractors and subcontractors, Walmart Suppliers, Walmart Construction Managers, Store management, and Pharmacy management.
  - 2. Notify all attendees at least two weeks prior to conference date.
  - 3. Review foreseeable methods and procedures related to modular construction work, including the following:
    - a. Review preparation and installation procedures and coordination and scheduling required with related work.
    - b. Tour, inspect and discuss current building conditions including assemblies affected by work of this section.
    - c. Review and finalize construction schedule related to modular construction and verify availability of materials, personnel, equipment, and facilities needed to complete work on time.
  - 4. Record conference discussions and decisions. Provide conference records to each party in attendance.

## 1.3 DELIVERY, STORAGE, AND HANDLING

- A. Product Delivery: Modular Supplier will deliver products to Site in drop trailers. Contact Owner's modular equipment Supplier after Award of Contract to establish delivery and coordination procedure.
- B. Product Packaging: Materials and modular assemblies will be delivered in manufacturer's standard packaging with identification markings on each component or package.
- C. Acceptance at Site: Inspect products with Supplier upon delivery of products to Site.
  - 1. Verify quantity of products furnished.
  - 2. Report discrepancies in product quantity delivered, or damage to products delivered to Supplier and Walmart immediately. Upon notification, Supplier will arrange for delivery of replacement products.
- D. Modular Package Identification: Verify complete modular products and equipment package with scheduled items as specified in Appendix A (13030).
- E. Manufacturing Defects and Modular Package Discrepancies: Immediately report suspected manufacturing defects or package incompleteness to Owner's Construction Manager and Supplier.
- F. Handle, store, and protect products in compliance with the requirements of Section 01600 and manufacturer's recommendations.

## PART 2 - PRODUCTS

### 2.1 OWNER FURNISHED PRODUCTS

- A. Owner's Suppliers will furnish materials and modular assemblies as specified in Appendix A (Section 13030).

### 2.2 ACCESSORIES

- A. Provide products, materials, and accessories as necessary for the complete project, which may include but are not limited to the following:
  - 1. Metal transition strip and Hilti fasteners for peel-and-stick carpet applications as recommended by transition manufacturer, where shown.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine existing conditions prior to beginning work in this Section.
- B. Identify obstructions that will prevent installation of modular construction in required timeframe.

### 3.2 PREPARATION

- A. Coordinate with entities responsible for other portions of the Work.
- B. Schedule Work to ensure Pharmacy remains open for business each day during regularly scheduled business hours. Coordinate with Walmart Construction Manager and Pharmacy Manager.
- C. Install dust protection as shown. Dust protection must be used each night and shall be removed each morning in advance of regularly scheduled Pharmacy business hours.

### 3.3 INSTALLATION

- A. Install materials and assemblies in accordance with manufacturer's instructions.
- B. Install fire suppression system components as indicated on Fire Protection drawings.
- C. Install heating, ventilating, and air conditioning system components as indicated on Mechanical drawings.
- D. Install lighting as indicated on Electrical drawings.
- E. Provide final electrical connections.
- F. Where necessary for proper adhesion of peel-and-stick carpet tiles, use primer as supplied with Modular package by Owner's Modular Supplier.
- G. Install plumbing work in accordance with manufacturers' instructions and as shown on Plumbing drawings.
- H.

### 3.4 ADJUSTING AND CLEANING

- A. Test doors for smooth operation through full range of swing. Adjust doors and hardware for smooth and balanced operation. Comply with ANSI A117.1.
- B. After completing installation, inspect exposed finishes and repair damaged finishes.

- C. Pharmacy and adjacent Sales areas shall be cleaned and cleared of obstructions each morning in advance of regularly scheduled Pharmacy business hours. Coordinate with Owner's Construction Manager and Pharmacy Manager.

3.5 PROTECTION

- A. Protect adjacent construction and surfaces from damage due to demolition and construction of modular systems.
- B. Coordinate protection of merchandise in Pharmacy and adjacent Sales areas with Owner's Construction Manager and Pharmacy Manager.

3.6 FIELD QUALITY CONTROL

- A. Correct deficiencies in Work which inspection indicates are not in compliance with Contract Documents.

END OF SECTION

## SECTION 13080 – SEISMIC PROTECTION FOR MECHANICAL, ELECTRICAL AND REFRIGERATION.

## PART 1 - GENERAL

## 1.1 SUMMARY

## A. Section Includes:

1. Seismic protection for architectural, mechanical, and electrical installations of equipment, systems and appurtenances specified herein.

## B. Related Requirements:

1. Section 05500 - Metal Fabrications. Seismic bracing for LP Monitor Support Assembly.
2. Section 07721 - Manufactured Curbs. Wind/Seismic restraint brackets for manufactured curbs by others.
3. Section 13220 - Water Storage Tank. Seismic structural calculations for fire suppression water tank by others.
4. Section 15050 - Basic Mechanical Materials and Methods. Seismic sway bracing for piping.
5. Section 15600 – Direct Expansion Refrigeration Systems.
6. Section 15800 - Air Distribution. Seismic sway bracing for duct work.

## 1.2 REFERENCES

## A. American Society for Testing and Materials (ASTM):

1. ASTM A36 - Carbon Structural Steel.
2. ASTM A307 - Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.
3. ASTM A325 - Structural Bolts, Steel, Heat Treated, 120/105 KSI Minimum Tensile Strength.
4. ASTM A501 - Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.

## B. American National Standards Institute (ANSI):

1. ANSI B18.2.1 - Square and Hex Bolts and Screws Inch Series.
2. ANSI B18.2.2 - Square and Hex Nuts (Inch Series).

## 1.3 SEQUENCING AND SCHEDULING

## A. Secure the services of the Seismic Restraint Manufacturer (hereinafter Restraint Manufacturer).

1. Procure the services of the same Restraint Manufacturer for all work included in this Section.
2. Prior to the start of construction, provide Refrigeration Contractor with Restraint Manufacturer's contact and coordination information.

## B. Coordinate with the Restraint Manufacturer for obtaining submittals as described herein.

## C. Verify that Mechanical EOR and Structural EOR coordination and acceptance of Restraint Manufacturer's submittal criteria are complete before seismic installation begins.

## 1.4 QUALITY ASSURANCE

## A. Seismic Restraint Manufacturer's Professional Engineer Qualifications: The Seismic Restraint Manufacturer shall employ or contractually consult with a professional engineer with at least five years of seismic design experience and licensed to practice in the jurisdiction where the Project is located.

## B. Seismic Restraint Manufacturer's Technical Representative Qualifications: The Seismic Restraint Manufacturer shall employ a factory trained technical representative who shall be on site periodically during seismic installation to provide observations, recommendations, and reports as specified in Part 3 herein.

- C. Special Inspection Agency Qualifications: Where periodic special inspection is required, employ an independent testing and inspection agency to inspect the seismic installations and provide final compliance reports as required by the authorities having jurisdiction.
  - 1. Submit Special Inspection Reports as closeout documents in accordance with the requirements of Section 01770.

## 1.5 SUBMITTALS

- A. Submittal Coordination: Provide submittals to the Architect of Record in accordance with Sections 01330 and 1770.
  - 1. Where required by the Authority Having Jurisdiction, Architect of Record shall submit MEP Seismic Restraint calculations, specifications, drawings, and details as a deferred submittal in accordance with Section 01330.
  - 2. Architect of Record shall provide Owner's Mechanical Engineer of Record with the Restraint Manufacturer's layout drawings for the purpose of the mechanical EOR's verification that all building facilities have been included. Other submittals described herein shall not be delivered to the mechanical EOR unless otherwise requested.
  - 3. Architect of Record shall provide Owner's Structural Engineer of Record with the Restraint Manufacturer's shop drawings and calculations for the purpose of the structural EOR's verification of acceptable seismic bracing as follows:
    - a. Top flanges of structural beams.
    - b. Upper truss chords in bar joist construction.
    - c. Cast in place inserts or wedge type post installed concrete anchors.
    - d. Wedge type post installed masonry anchors.
    - e. Seismic restraint framing shall not be attached to the roof deck.
  - 4. Architect of Record shall verify that seismic restraint calculations for all connections of equipment to the structure or anchored to the floor have been coordinated with Owner's structural Engineer of Record.
- B. Closeout Submittals: Submit as part of closeout submittals in accordance with the requirements of Section 01770.
  - 1. Restraint Manufacturer's Final Inspection Report: Provide a signed Final Inspection report from Restraint Manufacturer's technical representative as described in Part 3 herein.
  - 2. Special Inspection: When a special inspection is required, provide final reports obtained from the independent testing and inspection agency.
- C. Seismic Restraint Manufacturer Submittals: The Restraint Manufacturer's Professional Engineer shall provide data verifying that seismic restraint devices are designed to accept the seismic forces prescribed by the applicable building code requirements, acting through the equipment center of gravity. Overturning moments may exceed forces at ground level. Obtain the following signed and sealed submittals from Restraint Manufacturer's Professional Engineer:
  - 1. Descriptive Data:
    - a. Detailed schedules of flexible and rigidly mounted equipment, showing seismic restraints.
    - b. Special design consideration for piping crossing building expansion joints.
  - 2. Calculations: Dead loads, static seismic loads, and capacity of materials utilized for connections to equipment and structure.
  - 3. Shop Drawings:
    - a. Templates, erection details, and installation details.
    - b. Details of seismic restraints and anchors, including number, anchoring methods, embedment or welded length, size, and locations for each piece of equipment.
    - c. Anchor description including thickness, type, grade, class of metal, and dimensions.
    - d. Construction details, reinforcement, anchorage, and installation with relation to other building systems and construction.
    - e. Details of suspension and support for ceiling hung equipment.
    - f. Where walls, floors, slabs, or supplementary steel work are used for seismic restraint locations, provide details of acceptable attachment methods for ducts, conduit, and pipe to these portions of the building structure.
    - g. Housekeeping pad reinforcement and pad attachment details and design.

4. Layout Drawings:
  - a. Locations and types of seismic restraints for all equipment, piping, and conduit.
  - b. Coordination of seismic restraint locations with the structure and with other mechanical, electrical, and refrigeration components.

## PART 2 - PRODUCTS

### 2.1 DESIGN CRITERIA

- A. Seismic protection for mechanical, electrical, and refrigeration systems shall meet minimum requirements of the IBC and local building code for the assigned Seismic Design Category as described in the structural drawings.

### 2.2 MANUFACTURERS

- A. Provide seismic restraints and flexible couplings by the following manufacturers.
  1. Mason Industries, Inc., Contact Matt Cotter, (631) 348-0282, [mcotter@mason-ind.com](mailto:mcotter@mason-ind.com).
  2. Amber/Booth, a VCM Group Company, Contact Chip Morrow, (973) 838-1780.
  3. ISAT Seismic Bracing, Contact Chris Jacobs, (714) 412-8899, [chris@isatsb.com](mailto:chris@isatsb.com).
- B. Verify that all seismic restraints used in project are by the same manufacturer and are certified by the manufacturer.
- C. Substitutions: Not permitted.

### 2.3 FLEXIBLE PIPE CONNECTIONS

- A. Water Service:
  1. For flanged connections: Double sphere arch rubber expansion joint constructed of molded reinforced neoprene with integral steel floating flanges. Connectors suitable for a maximum working pressure (4 to 1 safety factor) of 150 psi and 225 degrees F. Spring loaded control units to limit movement to within acceptable tolerances.
  2. For threaded connections: Double spherical rubber hose connector, constructed of molded neoprene, nylon cord reinforced, with female pipe unions each end. Connectors suitable for a maximum working pressure (4 to 1 safety factor) of 150 psi and 225 degrees F, with cable control units to limit movement to within acceptable tolerances.

### 2.4 RESTRAINTS, BRACES, ANGLES

- A. Seismic Cable Restraints: Galvanized steel aircraft cables sized to resist seismic loads with a minimum safety factor of two and arranged to provide all-directional restraint; pre-stretched to achieve certified minimum modulus of elasticity. Cable end connections shall be steel assemblies that swivel to final installation angle and utilize two clamping bolts to provide proper cable engagement. Do not allow cables to bend across sharp edges.
- B. Seismic Solid Braces: Steel angles or channels to resist seismic loads with a minimum safety factor of 2 and arranged to provide all directional restraint. Seismic solid brace end connectors shall be steel assemblies that swivel to the final installation angle and utilize two through bolts to provide proper attachment.
  1. Steel Angles: Sized to prevent buckling, clamped to pipe or equipment rods utilizing a minimum of three ductile iron clamps at each restraint location when required.
  2. Pipe Braces: Provide pipe clevis cross bolt braces in all restraint locations. Provide special purpose preformed channels deep enough to be held in place by bolts passing over the cross bolt.
- C. Joist Attachment Hardware: Two cast pieces. Top piece with groove that fits between the two angles making up the upper cord of the bar joist, with threaded hole to allow attachment of cable brace assemblies. Lower assembly with neoprene friction pad.

### 2.5 HOUSEKEEPING PADS

- A. Provide housekeeping pads sized in accordance with the Restraint Manufacturer's recommendations and ACI requirements for bolt coverage and embedment.

## 2.6 ATTACHMENTS

- A. Provide restraint attachment plates cast into housekeeping pads, concrete inserts, double sided beam clamps, etc. in accordance with the requirements of the Restraint Manufacturer.

## 2.7 SUPPLEMENTARY SUPPORT STEEL

- A. Provide supplementary support steel for equipment and piping, including roof mounted equipment.

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Install seismic restraint equipment specified by the Restraint Manufacturer in accordance with the Construction Documents, component manufacturer's written recommendations, and in accordance with applicable local, state, and federal codes.
- B. Mechanical, electrical, and refrigeration systems may include but are not limited to the following systems. Verify that the following systems and equipment are protected as shown on the Contract Documents:
  - 1. Mechanical Systems (including owner furnished products and equipment):
    - a. Gas Distribution Systems.
    - b. Domestic Water Supply Systems.
    - c. Sanitary Drain, Waste and Vent Piping Systems.
    - d. Oil Piping Systems.
    - e. Compressed Air Systems.
    - f. Roof Mounted HVAC Equipment.
    - g. Suspended HVAC Equipment.
    - h. Drop Box Diffusers.
    - i. Water Heaters.
    - j. Domestic Hot Water Storage Tanks.
    - k. Waste Oil Cooking Tank.
    - l. Hydronic Distribution Piping.
    - m. Roof Drain Piping.
  - 2. Electrical Systems (including owner furnished products and equipment):
    - a. Conduit.
    - b. Bus Duct.
    - c. Cable Tray.
    - d. Panelboards.
    - e. Switchgear.
    - f. Light Fixtures.
    - g. Transformers.
  - 3. Refrigeration Systems (including owner furnished products and equipment):
    - a. Refrigerant Piping.
    - b. Condensate Piping.
    - c. Unit Coolers.
    - d. Compressor Racks or Compressor Houses.
    - e. Air-cooled Condensers.
    - f. Evaporative Condensers.
    - g. Cooling Towers.
    - h. Condenser Water Piping.
    - i. Condensing Units.



- C. Anchor interior and exterior mounts and hangers.
- D. Install cables to prevent excessive seismic motion and arrange as to not engage during normal operation.

### 3.2 INSTALLATION

- A. Sway Braces: Install sway braces in accordance with Restraint Manufacturer's recommendations and Contract Documents.
- B. Piping and Conduit Penetrations:
  - 1. Piping 3 inches in diameter and smaller: Install with 1 inch clearance from obstructions.
  - 2. Piping larger than 3 inches in diameter: Install with 2 inch clearance from obstructions.
  - 3. Install insulated and un-insulated pipes and conduit passing through walls and partitions (except smoke and fire walls and partitions) through not less than No. 12 gauge steel pipe sleeves finished flush with the finished wall surfaces. Center piping and conduit in the sleeves to assure free movement. Caulk between piping or conduit and sleeves.
- C. Flexible Couplings or Joints: Install flexible couplings in accordance with Restraint Manufacturer's recommendations and Contract Documents.
- D. Anchor Bolts: For floor or pad mounted equipment required under this Section, use cast-in-place or female wedge type anchor bolts in conformance with ASTM A 307 and anchor bolt manufacturer's written installation recommendations.
  - 1. Provide female wedge anchors with an evaluation report number from ICBO Evaluation Service.
  - 2. Provide anchor bolts with an embedded straight length equal to at least twelve times nominal diameter of the bolt.
- E. Housekeeping pads: Install size to provide a minimum edge distance of ten (10) bolt diameters all around the outermost anchor bolt to allow development of full drill-in wedge anchor ratings. If cast-in anchors are used, size the housekeeping pads in accordance with ACI recommendations for requirements for bolt coverage and embedment.

### 3.3 FIELD QUALITY CONTROL

- A. Testing, inspection, and observation by the Building Official, product manufacturer, or independent agency shall not relieve the Contractor of any responsibility to complete the work in accordance with the Contract Documents.
- B. Seismic Restraint Manufacturer's Technical Representative: Coordinate and schedule with a factory trained or certified representative of the Restraint Manufacturer to be on site periodically during seismic installation to offer observations and recommendations.
  - 1. Correct any deficiencies noted by Restraint Manufacturer's technical representative during installation.
- C. Restraint Manufacturer's Final Inspection and Report: At completion of the seismic installation, Restraint Manufacturer's technical representative shall inspect the work to verify conformance with Contract Documents. Obtain a signed final report from Restraint Manufacturer's technical representative and submit as a closeout document as described in Part 1 herein.
  - 1. Final report shall include notice of any remaining discrepancies.
- D. Report uncorrected discrepancies to the Owner, Architect of Record, and Restraint Manufacturer's Professional Engineer.

END OF SECTION

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## SECTION 13300 (13 3423) – VERTICAL BARRIER NET SYSTEM

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes: Owner furnished edge protection net system for installation by the Contractor at top of cooler/freezers.
- A. Related Requirements: The following list is intended to aid in locating work related to or dependent on the scope of Work in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
  - 1. Appendix A – Products and Work By Owner or Separate Contractor: General procedures, manufacturers, suppliers, vendor contacts, and product information for products and services by Owner.

## 1.2 DELIVERY, STORAGE, AND HANDLING

- A. Owner's Supplier will deliver Owner furnished products to site to be received by Contractor as specified in Section 01600.
- B. Product Packaging: Owner's Supplier will deliver products in manufacturer's original packaging with identification markings on each component or package.
- B. Receive and accept owner furnished products and report suspected defects and discrepancies in compliance with the requirements of Section 01600.
- C. Transport, handle, store, and protect products in compliance with the requirements of Section 01600 and manufacturer's recommendations.

## PART 2 - PRODUCTS

## 2.1 OWNER FURNISHED PRODUCTS

- A. Owner will furnish edge protection net system as specified in Appendix A (Section 13300) for installation by Contractor.

## PART 3 - EXECUTION

## 3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions and as indicated on the Drawings.
- B. Locate and attach netting system as shown.
- C. Cut netting with a hot knife and lash splices according to manufactures instructions.
- D. Attach manufacturer's identification label in a conspicuous location at each cooler/freezer box.

## 3.2 TESTING AND ADJUSTING

- A. After completing installation, inspect entire enclosure and test to assure proper performance for the intended purpose as recommended by the manufacturer.

END OF SECTION

## SECTION 13810 - BUILDING AUTOMATION SYSTEM (BAS)

## PART 1 - GENERAL

## 1.1 SUMMARY

## A. Section Includes:

1. Owner furnished Equipment for Installation by Contractor: Owner's BAS equipment supplier will furnish BAS equipment as indicated on Drawings and defined in Appendix A – Products and Work by Owner or separate Contractor. The BAS Installer shall be the General Contractor's installation subcontractor and shall receive and install Building Automation System equipment scheduled or shown on the Drawings and described in this Section.
2. Contractor furnished and installed conduit and related fittings, bushings, wire ties, fasteners, bolts, panduit labels, hangers and wire connectors.
3. Making of BAS terminations and installation of cables and conduit as applicable.
4. Proper identification of systems to include labeling Owner furnished BAS equipment.
5. Coordination with Structured Cabling for installation of Ethernet cable.
6. Coordination of Communication with Walmart Support Services for final download of system parameters.
7. Performance of on-site BAS test.
8. Coordination with BAS Supplier for final checkout of Building Automation System.
9. Coordination with Walmart Mechanical Services Department Construction Manager for Start-Up Week
10. Warranty of Building Automation System and Components.

## B. Related Requirements:

1. Appendix A – Products and Work by Owner or Separate Contractor.
  - a. General procedures related to Owner furnished products and transport, handle, store and protect products.
  - b. Manufacturers, suppliers, and vendor contacts and product names and numbers related to Owner furnished products.
2. Section 06100 - Rough Carpentry: Installation of 3/4-inch plywood backboard as shown on drawings.
3. Section 07840 – Firestopping.
4. Section 15600 – Installation of Refrigerated Equipment.
5. Section 15614 – Refrigerated Merchandise Fixtures Specifications.
6. Section 15700 – Heating, Ventilating and Air Conditioning Equipment.
7. Division 16: 120 VAC control wiring.
8. Division 16: Transformers, interface panels, phase loss sensor, and terminate all 120 VAC control wiring for Building Automation.
9. Division 16: 120 VAC Dedicated circuit for power to system and a 480 VAC 3 phase dedicated circuit for phase monitor voltage sensing.

## C. Contractor Responsibilities:

1. Provide (furnish and install) conduit and related fittings, bushings, wire ties, fasteners, bolts, panduit labels, hangers and wire connectors.
2. Install Building Automation equipment scheduled or shown on drawings and described in this Section.
3. Coordinate release of Owner furnished equipment with Walmart Mechanical Services Department.
4. Make all terminations to Owner furnished equipment.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. American National Standards Industry (ANSI)/Telecommunications Industry Association (TIA):
  1. TIA 568-C and -D, 569, 606, and TSB-140 Standards for various cabling and components for Commercial Building/Customer Premises.

2. ANSI 607 – Commercial Building Grounding and Bonding Requirements for Telecommunications.

1.3 CLOSEOUT SUBMITTAL

- A. Building Automation Punch List: Submit completed punch list to Walmart Stores Inc. for verification of completion and copy General Contractor.
- B. BAS Start-Up Report: Submit completed report Walmart Stores, Inc. Mechanical Services Department, for verification of completion.
- C. As-Built Drawings:
  - 1. Permanently attach in the main EDC framed or laminated as-built drawings for Building Automation System communication loop.
  - 2. Permanently attach near the refrigerated case input controller backboard, framed or laminated as-built drawings of the layout of refrigerated case module communication loop and sensors connected to refrigerated case controllers.
- D. Complete Building Automation Punch List: Send completed punch list to Walmart Stores Inc., 2001 SE 10th Street, Bentonville, AR 72712-0550, Attention: Mechanical Services Department Construction Manager, for verification of completion and copy General Contractor.
- E. NOVAR BAS Refrigeration Salvage Form: Submit completed form and equipment to Mechanical Construction Field Manager.
- F. NOVAR BAS HVAC Salvage Form: Submit completed form and equipment to Mechanical Construction Field Manager.

1.4 QUALITY ASSURANCE

- A. Provide one qualified technician available to handle emergencies connected with Building Automation work from the time job begins until the end of the 90 day warranty.
- B. Contractor Qualifications: Use BAS Vendor approved installers.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Section 01600 – Product Requirements: Transport, handle, store, and protect products.
- B. Handle, deliver, and store in manufacturer's original packaging, following manufacturer's recommendations.
- C. Store in a dry area and in a manner to prevent damage.
- D. Equipment shall remain boxed until ready for installation.
- E. Notify Owner of equipment received from carrier in damaged conditions and shortages. Obtain verification of damage from carrier's truck driver.
- F. Contractor will be held responsible for back charges from trucking company due to contractor failure to meet the owner's equipment delivery schedule.

1.6 DEFINITION OF TERMS

- A. Work: Complete Installation of equipment and devices in accordance with applicable specifications and as described in the Drawings, Application Sheets, Manufacturer's legend sheets and instructions, Request for Bids, and Purchase Orders.
- B. The Owner's authorized representative is defined as the Walmart Mechanical Services Department Construction

Manager.

- C. Building Automation contractor shall mean the Walmart approved, Subcontractor that is responsible for performing the Building Automation work as specified on the construction documents. Building Automation Contractor shall be responsible for compliance with applicable codes, ordinances, and work permits.

#### 1.7 DRAWINGS AND SPECIFICATIONS

- A. The Drawings and Specifications are complimentary. What is required by one shall be as binding as if required by both. Should the Drawings and Specifications be contradictory or should there be any apparent errors, discrepancies, or omissions, or should there be any doubt as to the meaning of either, the Contractor shall refer to the RFI Process.
- B. Neither the Contractor nor the Owner shall be responsible for oral instructions.
- C. Addenda, corrections, or letters issued during time of bidding shall take precedence over drawings and specifications.

#### 1.8 EXAMINATION OF THE PREMISES

- A. The Contractor's bid shall take into consideration all conditions which may affect the work under this contract.
- B. Take field measurements and verify field conditions; compare such field measurements and conditions and other information known to the Contractor with the Drawings and Specifications before commencing activities. Errors, inconsistencies or omissions discovered shall be reported through the RFI Process.

#### 1.9 SUPERVISION AND CONSTRUCTION PROCEDURES

- A. Contractor shall agree to undertake all Work contained within the Contract and complete the Work according to the approved construction schedule.
- B. The Owner's schedule is critical. The Contractor shall be responsible for meeting the schedule. Complete the following items prior to schedule Substantial Completion Date.
  - 1. BAS Equipment installed and working.
  - 2. Communication between all devices and controllers.
  - 3. Sensors tested (Test refrigeration sensors in accordance with procedure in Section 15.600).
  - 4. Confirm Ethernet communicating.
  - 5. Ensure the system is free of alarms or the alarms can be justified and documented.
- C. Furnish necessary supervision to coordinate activities of all trades to insure complete installation. Report problems or anticipated problems which may impede progress of the project to the Mechanical Services Construction manager.
- D. Check new equipment against Walmart Specifications and report discrepancies to Walmart Mechanical Services Department Construction Manager.

#### 1.10 WARRANTY

- A. Provide warranty and service on equipment and materials installed. Warranty shall include failures during installation and for 90 days beyond store Grand Opening date. Warranty shall include labor and parts for equipment covered under the specifications. Owner will require BAS Supplier to furnish replacement parts for failures of OEM Parts during installation period and for one year beyond store Grand Opening date. Contractor shall be responsible for obtaining replacement parts from BAS Supplier. Owner will not pay additional cost associated with repair or replacement of materials and parts during the warranty period. Additional cost attributed to equipment failures shall be handled directly with the BAS Supplier.
  - 1. In the event the Contractor fails to respond to emergency calls or fails to perform required maintenance or repairs during a warranty period, the Owner will have the right to have the repair or maintenance performed

by another contractor. In this case, the Contractor agrees to pay Owner the involved amount of the services performed plus 15 percent. Maximum response time to emergency calls as follows:

- a. Building Automation System - 8 hours
  - b. Refrigeration Control System - 2 hours
2. If the Contractor subcontracts the warranty work, the 90-day warranty responsibility remains with the primary Contractor. The Contractor shall resolve all payments between the two parties. The Owner will not be involved in resolving payment issues. If the Building Automation Contractor fails to respond to warranty calls, Walmart will remove that contractor from the New Store Bid List until such a time when all disputes or claims are settled.

#### 1.11 MANUFACTURER'S WARRANTIES AND INSTRUCTIONS

- A. Nothing shall be done by the Contractor which will void any manufacturer's warranty.

#### 1.12 LAWS AND ORDINANCES

- A. Comply with laws, ordinances, rules, and regulations bearing on the Work. If the Contractor observes that Drawings or Specifications, or both are at variance therewith, the Contractor shall promptly notify the Owner in writing. If the Contractor, without written notice to the Owner, performs work, which is not in conformance with such laws, ordinances, rules and regulations, Contractor shall bear all cost arising from correction thereof.
- B. Compliance with laws, rules, and regulations shall not be used as means of justifying installations or applications of parts assemblies, or methods inferior to those specified.
- C. Comply with OSHA regulations. A copy of all appropriate M.S.D.S. sheets shall be on the job at all times.

#### 1.13 INSPECTION OF WORK

- A. The Owner shall have access to the Work at all times for purpose of inspection.
- B. If specifications, Instructions, Inspection Coordinators, or laws, ordinances, rules, regulations or any public authority require a portion of the work to be tested, approved or inspected, Contractor shall give the Owner timely notice of its readiness for inspection.

#### 1.14 CHANGES IN THE WORK

- A. Do not make changes, perform additional work, or pay for additional work unless authorized in writing by the Owner.

#### 1.15 DEDUCTIONS FOR WORK NOT CORRECTED

- A. If the Owner deems it expedient to correct work not conforming to the Contract or defective work, an equitable deduction from the contract price will be made.

#### 1.16 CORRECTION OF WORK BEFORE FINAL PAYMENT

- A. If the Owner rejects a portion of the work due to failure to conform to the Contract, the Owner will promptly notify the Contractor of such failure.
- B. Upon receipt of such notice, replace or remedy (whichever the Owner requires) the rejected work to conform to the Contract.
- C. Contractor shall bear all expenses incident to correction of non-conforming work including cost of transportation, removal of non-conforming work, correction of the work, and repairs to work of other contractors necessitated by remedial work.

#### 1.17 PROTECTION



- A. Protect all Work from damage until final acceptance by the Owner. Damaged or defective work shall be replaced at Contractor's expense.
- B. Contractor shall be responsible for damage caused by Contractor's own forces or by Contractor's subcontractor's forces.
- C. Replace damaged work at no expense to the Owner.

#### 1.18 USE OF PREMISES

- A. Confine apparatus, storing of materials and operations of workers to limits indicated by the Owner. Do not unreasonably encumber premises with materials.
- B. Promptly remove material interfering with work of other contractors, if directed by the Owner.
- C. Enforce the Owner's policies regarding signs, advertisements, and smoking.

#### 1.19 TAXES

- A. Contractor shall include in his bid, costs of state or local sales or use taxes and federal taxes, charges, or duties of any nature applicable to the work incorporated under this Contract.

#### 1.20 SPECIAL DAYS

- A. Keep one qualified technician available to handle emergencies connected with Building Automation work from the time job begins until the end of the 90 day warranty. The Owner reserves the right to have the Contractor replace the technician if the Owner feels the present technician is failing to respond or is unqualified.

#### 1.21 REQUEST FOR INFORMATION SUBMITTAL

- A. All Request for Information (RFIs) regarding BAS shall follow the attached copy of the Request for Information Process Flow Chart.
- B. Refer to Specification Section 01255 for RFI Information Submittal Process.

### PART 2 - PRODUCTS

#### 2.1 BUILDING AUTOMATION SYSTEMS

- A. Unless otherwise specified to be furnished by Contractor, Owner's BAS supplier will furnish energy monitoring and control system components indicated on Drawings and as specified in Appendix A Section 13810.

#### 2.2 MATERIALS (CONTRACTOR FURNISHED AND INSTALLED)

- A. Conduit and Accessories: Conduit, and associated fittings and boxes shall conform to requirements of Section 16100. Provide type and size as appropriate for conditions and locations as shown on the drawings and for the following conditions:
  - 1. Required by local electrical codes.
  - 2. Cables are installed in a plenum space used for return air.
  - 3. Cables are installed outside building.
  - 4. Cables are installed less than 15 feet AFF in sales area and stockrooms.
  - 5. Cables are subject to physical damage.
  - 6. Cables pass through any firewall.
  - 7. Cables are installed underground.
  - 8. Cables are installed in concealed area.
  - 9. Cables are installed in finished area except HVAC cable in Sales Area.
  - 10. Cables are installed in finished wall.

11. Cables are installed under refrigerated cases.

B. Current Transducers for retrofits and new construction: Only revenue-grade current transducers will be accepted. For pricing and ordering information contact BAS Supplier

C. For replacement of damaged parts, only controls manufactured by the BAS Supplier will be accepted. For pricing and ordering information, contact BAS Supplier

### 2.3 FABRICATIONS (BY CONTRACTOR)

A. The following describes items and/or functions necessary for field installation:

1. Wire stripping and heat shrink and routing wires
2. Junction boxes to mount wall temp sensors
3. Override panel
4. Installation of conduit
5. CO2 sensors
6. Light dimming
7. Communication cable between controllers
8. Mounting of BAS parts
9. Dual-temperature switches

## PART 3 - EXECUTION

### 3.1 RESPONSIBILITY

A. All Part 3 Execution requirements specified below shall be the responsibility of the Contractor.

### 3.2 INSTALLATION

A. Install BAS components provided in this section in accordance with BAS Vendor Specific installation instructions and make all 24 VAC control terminations required.

B. BAS Installer shall be a Certified Data Technician.

C. Address BAS equipment and controllers and mark on equipment label.

D. In portions of installation where conduit is not necessary, tie wrap cables every 36 inches or a minimum distance of the bar joist spacing. Cables shall be supported by the building structure.

E. Provide wire ties for BAS cable. Colors shall be black UV resistant for RTU and sensor mast assembly, white for inside store in open ceilings, and any color in EDC houses and in BAS equipment.

F. Install Building Automation Sensors where shown on drawing or to Owner's specifications to BAS Supplier installation and hardware mounting procedures.

G. Verify proper Application Specific Controllers are installed in equipment in accordance with BAS Supplier installation and hardware mounting procedures.

H. Generic Input/Output Controller (IOC):

1. Ground IOC with #12 green AWG wire.
2. IOC legend shall be typed
3. IOC lock down screws shall be tightened

I. Global Network Controller (GNC):

1. Provide a solidly grounded green insulated conductor, minimum size of #12 AWG, from GNC to system ground buss at main distribution board.
2. Mount GNC display 60 to 72 inches from finished floor, at eye level for the average height person.

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3. Provide required clearances for GNC Ethernet connection.
4. GNC lock down screw shall be tightened.

J. Cable:

1. Provide installation of communication cable between all network devices. Communication cable must be wired in a “true” daisy chain. Follow Vendor specific construction document details. One in and One out per controller comm terminal port. “Star” configurations are not permitted.
2. Cable installations shall comply with ANSI/TIA standards.
3. All communication cable must be the size and type as indicated on construction documents.
4. Before making final terminations, remove and cut wire to length with approximately 12” excess on each end or (per manufacturer’s instructions).
5. Do not over strip connections. Strip only sufficient amount to fit under terminal. Twist stranded wires before making connections. Be certain to not create loose conductors that may accidentally ground or short other adjacent conductors.
6. Do not splice BAS cables for BAS components unless absolutely necessary.
7. Splices shall be soldered, heat shrunk, or sealed solder butt splice type connection (Elektralink sealed Solder Butt Splice or equivalent) and concealed in a junction box. Crimp only connectors or wire nuts are not allowed.
8. Refrigerated case connections may use gel cap type connectors (3m – 314 Gel Cap Connector).
9. Cables from rack house to condensers shall be in conduit or flexible metallic liquid tight conduit.
10. Cables shall be sealed in roof top unit. (Duct seal, caulk, or other type of sealant.)
11. Cable shall have heat shrink at terminating ends. (No tape allowed.)
12. No drooping or excessive sagging cables.
13. Do not install CAT-5 cable runs longer than 295 feet.
14. Install cabling systems away from electromagnetic interference sources. Installations must be a minimum distance from interference sources as follows:
  - a. 12 inches from power lines/electric motors.
  - b. 47 inches from transformers.
  - c. 6 inches from lights.
15. Support horizontal cable every 4 feet and 5 feet, alternating.
16. No cable shall run though a raw metal edge hole. Use bushings and chase nipples as needed.
17. Fire rated and sheetrock walls that have BAS cables passing through them shall have an EMT pipe sleeve with bushings on the ends. Fire caulk will be provided by others.

K. Outdoor Assembly: If Required

1. Mount outdoor assembly to 1-1/4 inch rigid conduit through roof (provided by others).
2. Install sensor assembly 5 feet above roof and a minimum of ten feet from edge of roof or from HVAC equipment.

L. Conduit:

1. Installation, EMT:
  - a. The number of conductors permitted in single tubing shall not exceed the percentage fill listed in NEC
  - b. There shall be no more than the equivalent of four-quarter bends (360 degrees total) between pull points.
  - c. Bends in the tubing shall be made so that the tubing will not be damaged, and the internal diameter of the tubing will not be effectively reduced.
  - d. All cut ends of tubing shall be reamed to remove rough edges.
  - e. Boxes and fittings shall comply with NEC.
  - f. Tubing shall be supported at least every 10 feet and within 3 feet of junction boxes or devices
2. Installation, Armored Cable:
  - a. Type AC/MC cable shall be secured by approved staples, hangers, and straps, as not to damage the cable, at intervals not more than 4 1/2 feet and within 12 inches of junction box or another device
  - b. Fittings shall be used at all ends of armored cables and meet NEC specifications.
  - c. Bends shall be made so as not to damage cable.
3. Run conduit from zone sensor to junction box at roof structure. Provide 3/4” conduit from roof top unit low voltage wiring compartment, down through roof curb .
4. Run conduit along bar joist for communication loop and clamp securely.

- 5. Provide Panduit plastic wire raceway or equivalent in electrical rooms and refrigerated case input/output controller mounting area where necessary
- M. Bushings:
  - 1. Provide properly bushed opening for raceways ending as open conduit.
  - 2. Cables shall pass through a bushing into the roof top unit.
- N. Nipples: BAS Installer will provide properly sized conduit nipples for building automation system cable sets as indicated on Drawings and for the following conditions:
  - 1. Required by local codes.
  - 2. Cables pass through wall.
  - 3. Cables pass through floor.
- O. Boxes: BAS Installer will provide properly sized boxes for open conduit systems.
- P. Light Dimming:
  - 1. All light dimming fixtures are to be tied together by conduit, flex, or box 14 gauge wire or larger.
  - 2. Home run to dimming control shall be 14 gauge or larger in conduit or flex.
  - 3. MC cable is permitted for connecting light fixtures together for low voltage control purposes.
  - 4. Separation between lighting power supply wiring and lighting control wiring shall comply with NEC.

### 3.3 IDENTIFICATION

- A. Provide electronic, permanent labels for location of each refrigeration sensor identifying circuit. No hand written, or pre-printed labels are allowed.
- B. Label refrigeration sensors at location in cases with electronic, permanent labels.
- C. Provide electronic, permanent labels with 3/4-inch nominal size numbers corresponding to associated mechanical equipment for zone temperature sensors.
- D. Label each wire a minimum of one inch from end, identifying cable. Label to be affixed to incoming and outgoing comm cables stating where cable is terminated on the other end.
- E. Label breakers for Building Automation System with orange stickers: "DO NOT TURN OFF!"
- F. As-Built Drawings:
  - 1. Permanently attach in the main EDC framed or laminated as-built drawings for Building Automation System communication loop.
- G. Permanently attach near the refrigerated case input controller backboard, framed or laminated as-built drawings of the layout of refrigerated case module communication loop and sensors connected to refrigerated case input controllers.

### 3.4 CLEAN UP

- A. Promptly remove all rubbish or debris resulting from the Work.
- B. During the course of the Work, the area in which the Contractor is working shall be kept in an orderly, reasonably clean condition. Keep gang boxes, spools of wire, and boxes off of sales floor. Tools, supplies, etc. shall remain only as long as they are in use. Abide by site cleanliness policies of General Contractor for general construction.
- C. Thoroughly clean Work furnished and installed under this Contract, ready for Owner's use.

### 3.5 START-UP

- A. Building Automation equipment start-up and documentation of operation shall be in accordance with Walmart 13810-8

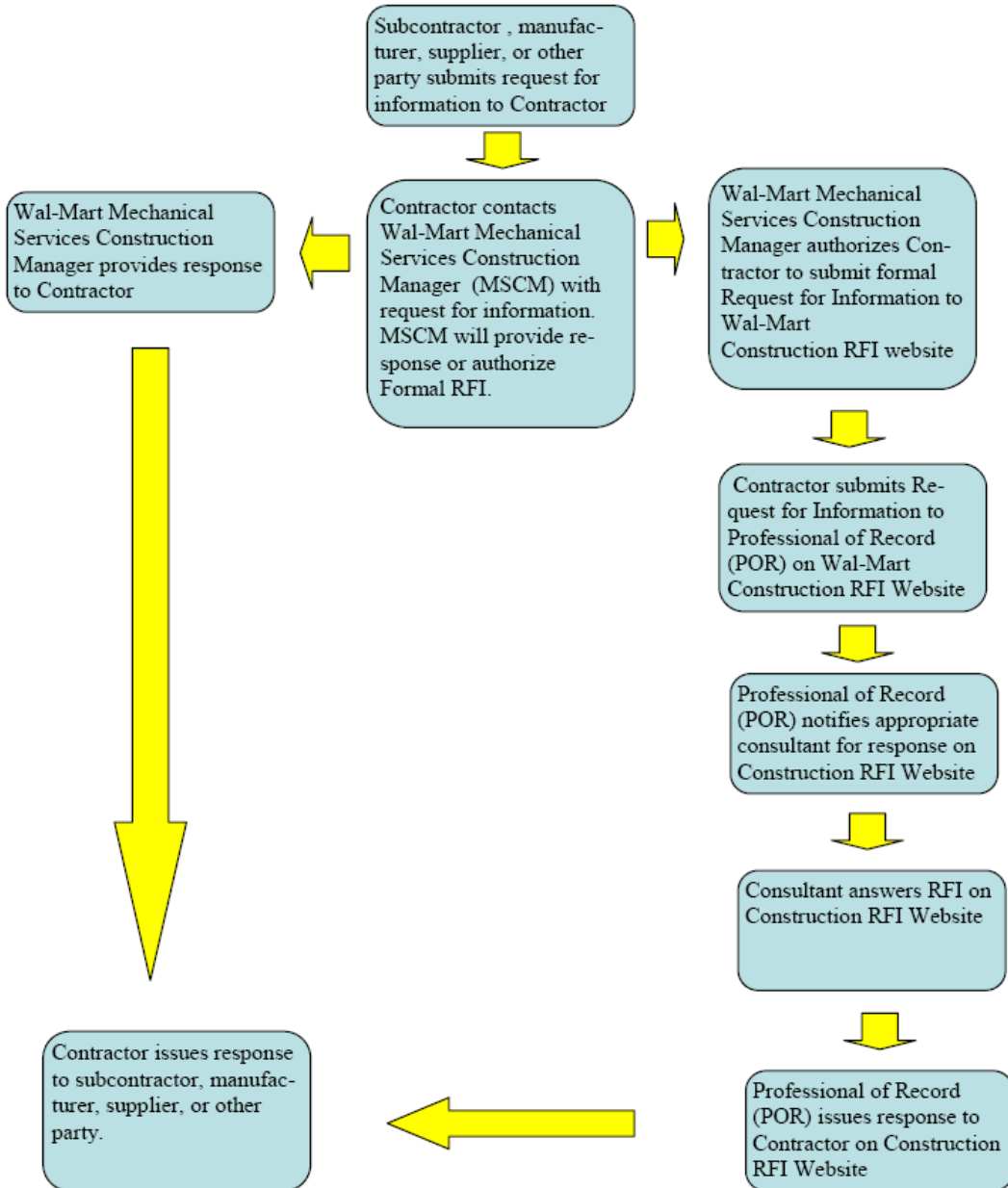
Specifications. Final payment will not be made until start-up reports are received and checkout paperwork is turned over to Walmart Building Automation.

- B. Provide adequate number of qualified personnel for start-up period. If the Walmart Mechanical Services Department Construction Manager determines that the schedule cannot be met, provide additional startup personnel for completion in that time frame.
- C. Fill out the attached checkout paperwork and send to Walmart Building Automation Department.
  - 1. Pre-checkout forms: Walmart Support Installation Form, HVAC Information, Cutler Hammer Module Configurations and Pre-Checkout Verification Form.
  - 2. Checkout forms: Refrigerated Case Sensor Input Verification, Pulse Meter Letter, Phase Loss Information, Operating Information and Manager's Orientation.
- D. Start-up shall include but not limited to the following:
  - 1. Verify all modules are communicating.
  - 2. Test and guarantee CAT5E cable installation to level standards (350mhz) in accordance with ANSI/TIA standards for commercial building telecommunications cabling.
    - a. Test shall include Connectivity Report, Wire Map, Near/Far end cross talk, and line lengths.
    - b. Provide a copy of test report to [Steve.Bennett@walmart.com](mailto:Steve.Bennett@walmart.com).
  - 3. Verify all terminations are correct.
  - 4. Verify all sensor locations.
  - 5. Verify, ice bath, and calibrate to +/- one-degree Fahrenheit if needed on all refrigeration sensors.
  - 6. Replace any modules or sensors that are defective.

### 3.6 CHECKOUT

- A. Coordinate with Walmart Support for final checkout. The Building Automation Contractor shall not receive final approval until final checkout is complete and deficiencies have been corrected. System documentation will not be complete until Building Automation Contractor has been received final checkout verification number from Walmart Support.
- B. Checkout shall include, but is not limited to, the following:
  - 1. Complete Pre-checkout.
  - 2. Complete on-line checkout.
  - 3. Complete testing of CAT5E cable in accordance with the requirements of ANSI/TIA standards.
  - 4. Network status.
  - 5. Phase loss monitors.
  - 6. Override verification.
  - 7. Address verification.
  - 8. Alarm log verification.
  - 9. Transducer verification
  - 10. Light dimming: Dim lights from 100% down to minimum and back up to 100% to demonstrate proper operation.
  - 11. ALS & hi/lo output verification.
  - 12. Temperature sensor verification.
  - 13. CO2 sensor verification.
  - 14. Humidity sensor verification.
  - 15. RTU damper/actuator verification.

**HVAC/REFRIGERATION/EMS  
REQUEST FOR INFORMATION  
PROCESS FLOW CHART  
WAL-MART STORES, SUPERCENTER, SAM'S CLUB,  
NEIGHBORHOOD MARKET**



## WALMART SUPPORT INSTALLATION FORM

Store # \_\_\_\_\_ Date : \_\_\_\_\_

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

City : \_\_\_\_\_ State : \_\_\_\_\_ Zip : \_\_\_\_\_

BAS phone # \_\_\_\_\_ Store phone # \_\_\_\_\_

Poss date : \_\_\_\_\_ G.O. Date : \_\_\_\_\_

GNC Serial # \_\_\_\_\_

Ethernet adapter serial # \_\_\_\_\_

MAC address : \_\_\_\_\_ Switch: \_\_\_\_\_ Port # \_\_\_\_\_

New : \_\_\_\_\_ Remodel : \_\_\_\_\_ Expansion : \_\_\_\_\_ Changeout : \_\_\_\_\_

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

Contractor 24 hr # \_\_\_\_\_ Installer : \_\_\_\_\_

Time zone : \_\_\_\_\_ Daylight savings time : \_\_\_\_\_

Lighting control by: \_\_\_\_\_ Cutler Hammer S.O.B. \_\_\_\_\_ Contactors: \_\_\_\_\_

Square-D Powerlink: \_\_\_\_\_ Cutler Hammer: \_\_\_\_\_

Number Of Phase Loss Monitors: \_\_\_\_\_

If store has light dimming ballast, is the negative (gray) control wire from dimming ballast grounded? \_\_\_\_\_

### List any programming changes below

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**WALMART SUPPORT INSTALLATION FORM (continued)**

BAS Phone # \_\_\_\_\_ Main Store # \_\_\_\_\_

Type Of Lighting      Fluorescent: \_\_\_\_\_ Halide: \_\_\_\_\_

Light Dimming Fluorescent:      Yes \_\_\_\_\_ No \_\_\_\_\_ High / Low:      Yes \_\_\_\_\_ No \_\_\_\_\_

What Panel And Circuit Breaker Feeds 120vac To GNC Transformer?  
Panel: \_\_\_\_\_ Circuit Breaker: \_\_\_\_\_

What Panel And Circuit Breaker Feeds 120vac To IOC Transformer?  
IOC Designation: \_\_\_\_\_ Panel: \_\_\_\_\_ Circuit Breaker: \_\_\_\_\_

What Panel And Circuit Breaker Feeds 120vac To IOC Transformer?  
IOC Designation: \_\_\_\_\_ Panel: \_\_\_\_\_ Circuit Breaker: \_\_\_\_\_

What Panel And Circuit Breaker Feeds 120vac To IOC Transformer?  
IOC Designation: \_\_\_\_\_ Panel: \_\_\_\_\_ Circuit Breaker: \_\_\_\_\_

What Panel And Circuit Breaker Feeds 120vac To IOC Transformer?  
IOC Designation: \_\_\_\_\_ Panel: \_\_\_\_\_ Circuit Breaker: \_\_\_\_\_

What Panel And Circuit Breaker Feeds 120vac To IOC Transformer?  
IOC Designation: \_\_\_\_\_ Panel: \_\_\_\_\_ Circuit Breaker: \_\_\_\_\_

If Store Has Contactors, What Panel And Circuit Feeds 120vac To Contactor?  
Panel: \_\_\_\_\_ Circuit Breaker: \_\_\_\_\_

If Store Has Cutler Hammer S.O.B.S, What Panels & Circuit Breakers Feed 120vac To S.O.B.S?

Panel: _____	Circuit Breaker: _____
Panel: _____	Circuit Breaker: _____
Panel: _____	Circuit Breaker: _____
Panel: _____	Circuit Breaker: _____

Are All BAS Circuit Breakers Marked With Orange BAS Stickers?  
Yes \_\_\_\_\_ If No Explain: \_\_\_\_\_



**WALMART SUPPORT INSTALLATION FORM (continued)**

**SUBMIT THIS PAGE FOR FINAL DRAFT**

Checkout Number: \_\_\_\_\_ Date: \_\_\_\_\_

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

Contractor 24 hr # \_\_\_\_\_ Installer : \_\_\_\_\_

Refrigeration start-up: Signature of Walmart Mechanical Services Department Construction Manager:

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

**Attach completed punch list**

Make 4 sets of all information and distribute to the following :

1. General Contractor after final checkout (developer projects only)
2. BAS supplier after all signatures are obtained
3. Walmart HVAC technician (leave in package near GNC)
4. Installer's work file

Comments:

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Explanations:

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## **PRE-CHECKOUT VERIFICATION FORM**

- \_\_\_\_\_ HOA switches in AUTO position for IOCs
- \_\_\_\_\_ Phase Loss Monitors wired and working properly
- \_\_\_\_\_ Sensors reading properly
- \_\_\_\_\_ No Communications Losses or Alarms exist
- \_\_\_\_\_ No Meter failed alarms
- \_\_\_\_\_ Overrides wired and working properly
- \_\_\_\_\_ Exterior lights override in off position
- \_\_\_\_\_ Verify exterior lights are working properly
- \_\_\_\_\_ Verify inside ALS is working properly by covering it and reading GNC display
- \_\_\_\_\_ Verify each CO2 sensor has its own power supply and is working properly
- \_\_\_\_\_ Verify CO2 dampers are working properly
- \_\_\_\_\_ Verify light dimming is working properly
- \_\_\_\_\_ Verify IOC outputs are working properly
- \_\_\_\_\_ Verify phone line is in, number is correct, and functioning

Each of the above lines shall be checked off with the technician's initials.

Without this Verification Form, on-line checkout will not begin.

Signed: \_\_\_\_\_

BAS Company: \_\_\_\_\_

Store #: \_\_\_\_\_ Location: \_\_\_\_\_





## CUTLER HAMMER MODULE CONFIGURATIONS

Panel: \_\_\_\_\_ Module Address: \_\_\_\_\_  
 Panel Location: \_\_\_\_\_ Number Of Circuits: \_\_\_\_\_

2P	CRK	LOAD	SOB	CRK	LOAD	SOB	2P
	1			2			
	3			4			
	5			6			
	7			8			
	9			10			
	11			12			
	13			14			
	15			16			
	17			18			
	19			20			
	21			22			
	23			24			
	25			26			
	27			28			
	29			30			
	31			32			
	33			34			
	35			36			
	37			38			
	39			40			
	41			42			

Indicate 2 pole breakers by checking “2p” box.

## CUTLER HAMMER MODULE CONFIGURATIONS

Panel: \_\_\_\_\_ Module Address: \_\_\_\_\_  
 Panel Location: \_\_\_\_\_ Number Of Circuits: \_\_\_\_\_

2P	CRK	LOAD	SOB	CRK	LOAD	SOB	2P
	43			44			
	45			46			
	47			48			
	49			50			
	51			52			
	53			54			
	55			56			
	57			58			
	59			60			
	61			62			
	63			64			
	65			66			
	67			68			
	69			70			
	71			72			
	73			74			
	75			76			
	77			78			
	79			80			
	81			82			
	83			84			

Indicate 2 pole breakers by checking “2p” box.

## REFRIGERATED CASE SENSOR INPUT VERIFICATION

<b>Store #</b>	<b>Location:</b>	<b>Walmart Acceptance:</b>
<b>Date:</b>	<b>Tested By:</b>	<b>Company:</b>

Module ID:				Module ID:				Module ID:			
S/N:				S/N:				S/N:			
Location:				Location:				Location:			
Input # Sensor ID	Sensor Input Readings			Input # Sensor ID	Sensor Input Readings			Input # Sensor ID	Sensor Input Readings		
	Pre-Cal	Post-Cal	Startup		Pre-Cal	Post-Cal	Startup		Pre-Cal	Post-Cal	Startup
1)				1)				1)			
2)				2)				2)			
3)				3)				3)			
4)				4)				4)			
5)				5)				5)			
6)				6)				6)			
7)				7)				7)			
8)				8)				8)			
9) Cir #		DT Switch Y / N		9) Cir #		DT Switch Y / N		9) Cir #		DT Switch Y / N	
Notes:				Notes:				Notes:			
Module ID:				Module ID:				Module ID:			
S/N:				S/N:				S/N:			
Location:				Location:				Location:			
Input # Sensor ID	Sensor Input Readings			Input # Sensor ID	Sensor Input Readings			Input # Sensor ID	Sensor Input Readings		
	Pre-Cal	Post-Cal	Startup		Pre-Cal	Post-Cal	Startup		Pre-Cal	Post-Cal	Startup
1)				1)				1)			
2)				2)				2)			
3)				3)				3)			
4)				4)				4)			
5)				5)				5)			
6)				6)				6)			
7)				7)				7)			
8)				8)				8)			
9) Cir #		DT Switch Y / N		9) Cir #		DT Switch Y / N		9) Cir #		DT Switch Y / N	
Notes:				Notes:				Notes:			

Immerse sensor in ice bath. Allow ample time for reading to stabilize. Record reading in Pre-Cal column. If sensor requires adjustment, follow calibration procedures. Record adjusted ready in Post-Cal column. Startup column is for BAS Supplier factory representative spot-check at refrigeration equipment startup.

## PULSE METER LETTER

Cutler-Hammer IQ 200 Electrical Distribution System Meter

System Frequency	
Wiring Configuration	
Current Transformer Ratio	
Potential Transformer Ratio	
Demand Window	
KYZ Output Setting	
Energy per Pulse Rate	

Example:

System Frequency	60 Hz
Wiring Configuration	4 wire
Current Transformer Ratio	1200/5
Potential Transformer Ratio	N/A
Demand Window	5 min
KYZ Output Setting	KWh
Energy per Pulse Rate	1



## PHASE LOSS INFORMATION

How many phase loss monitors exist in store? \_\_\_\_\_

Phase loss sensor cable wired between the common and the normally closed contacts?

Yes \_\_\_\_\_ if no, explain \_\_\_\_\_

Input to global network controller (GNC) is connected to phase loss input terminals?

Yes \_\_\_\_\_ if no, explain \_\_\_\_\_

480 volts to phase loss monitor(s)? Yes \_\_\_\_\_

What panel and circuit feed 480vac to phase loss monitor(s)?

Panel: \_\_\_\_\_ Circuit Breaker: \_\_\_\_\_

Panel: \_\_\_\_\_ Circuit Breaker: \_\_\_\_\_

Panel: \_\_\_\_\_ Circuit Breaker: \_\_\_\_\_

Panel: \_\_\_\_\_ Circuit Breaker: \_\_\_\_\_

Panel: \_\_\_\_\_ Circuit Breaker: \_\_\_\_\_

VOLTAGES	PLS #1	PLS #2	PLS #3	PLS #4	PLS #5
A To C					
B To C					
A To B					
A To Ground					
B To Ground					
C To Ground					

Phase Loss Sensor

Under-Voltage: \_\_\_\_\_ Vac

Over-Voltage: \_\_\_\_\_ Vac

Delay: \_\_\_\_\_ Seconds

Lighting information: Include copy of appropriate electrical drawing(s) indicating type of lighting control used, loads and their power circuits. (Use the one line drawing for the contactors, IFP(s), LCU(s) or Cutler Hammer-1000(s) from electrical drawings in plans.)

## OPERATING INFORMATION

Communications established with Walmart support: How many phase loss.

Yes\_\_\_\_\_ if no, explain\_\_\_\_\_

Each BAS cable is labeled and run without splice. (Include rooftop map from BAS1 drawings showing any changes – use red ink on original.)

Yes\_\_\_\_\_ if no, explain\_\_\_\_\_

System cables meet material specifications.

Yes\_\_\_\_\_ if no, explain\_\_\_\_\_

Outdoor sensor assembly mounted per plans and facing north.

Yes\_\_\_\_\_ if no, explain\_\_\_\_\_

All system wiring is neatly tie-wrapped and not exposed to the elements.

Yes\_\_\_\_\_ if no, explain\_\_\_\_\_

Global network controller (GNC) batter jumper installed in proper position.

Yes\_\_\_\_\_ if no, explain\_\_\_\_\_

Ethernet communication has been established and tested in accordance with ANSI/TIA Standards.

Yes\_\_\_\_\_ if no, explain\_\_\_\_\_

Activation of HOA switch to each position (off, on, auto) cause all loads to turn off or on according to the white label attached to the transition board of the input/output controller (IOC).

Yes\_\_\_\_\_ if no, explain\_\_\_\_\_

Demonstrate battery backup works by lifting global network controller (GNC) from its power supply then replacing it.

Yes\_\_\_\_\_ if no, explain\_\_\_\_\_

Demand pulse generator (DPG – demand meter) is functioning and global network controller (GNC) reads correct kw usage as calculated using formula on the pulse meter.

Yes\_\_\_\_\_ if no, explain\_\_\_\_\_

## NOVAR BAS REFRIGERATION SALVAGE FORM

<b>Novar Equipment and Counts - Refrigeration</b>		
Once verified send copy to bethany.castor@Walmart.com		
Novar Parts	Quantity	Any Noticeable Defects
RC		
RC2xe		
AOM		
COM		
RIM		
CCM		
ROM		
CIM		
CIM2		
8IM		
CMS		
Case Controller's		
Case Controller Power module		
Tranformers		
Sensors		

\_\_\_\_\_

Store Number

\_\_\_\_\_

Date

\_\_\_\_\_

BAS Contractor

**NOVAR BAS HVAC SALVAGE FORM**

Novar Equipment and Counts - HVAC		
Once verified send copy to bethany.castor@Walmart.com		
Novar Parts	Quantity	Any Noticeable Defects
EP2		
LingoXE		
LSE		
IOM/2		
IOM1010		
MINio		
LSE		
NCH-1000		
NSD/M1		
Hawki		
VAV-4040		
Eclipse		

\_\_\_\_\_

Store Number

\_\_\_\_\_

Date

\_\_\_\_\_

BAS Contractor

END OF SECTION

## SECTION 13900 - FIRE SUPPRESSION

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
1. Automatic sprinkler systems.
  2. Sprinkler heads furnished by Owner for installation by Contractor.
  3. Fire protection sprinkler piping work with feed and cross main piping, branch line piping, test valves, test connections, and sprinklers.
  4. Sprinkler heads furnished and installed by Contractor.
  5. Flow indicators, valves, gauges, alarms, drain piping, and supervisory switches.
  6. System design, installation and certification.
- B. Related Requirements: The following list is intended to aid in locating work related to or dependent on the scope of Work in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
1. Section 02510 - Water Distribution Systems.
  2. Section 09900 - Paints and Coatings.
  3. Appendix A – Products and Work by Owner or Separate Contractor: Manufacturers, suppliers, product information, and general procedures related to Owner furnished products.
  4. Appendix B – Testing, Inspection, and Observation by Owner: Procedures for Observation by Owner’s Fire Protection Engineer.

## 1.2 REFERENCES

- A. ASTM International (ASTM):
1. ASTM A 47 - Ferritic Malleable Iron Castings
  2. ASTM A 53 - Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
  3. ASTM A 135 - Electric-Resistance-Welded Steel Pipe
  4. ASTM A 234 - Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service
  5. ASTM A 536 - Ductile Iron Castings
  6. ASTM A 795 - Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for Fire Protection Use
  7. ASTM A 865 - Threaded Couplings, Steel, Black or Zinc-Coated (Galvanized) Welded or Seamless, for Use in Steel Pipe Joints
- B. American Society of Mechanical Engineers (ASME):
1. ASME B 16.1 - Grey Iron Pipe Flanges and Flanged Fittings
  2. ASME B 16.3 - Malleable Iron Threaded Fittings
  3. ASME B 16.4 - Gray Iron Threaded Fittings
  4. ASME B 16.5 - Pipe Flanges and Flanged Fittings: NPS 1/2 Through NPS 24, Metric/Inch Standard
  5. ASME B 16.9 - Factory-Made Wrought Buttwelding Fittings
  6. ASME B 16.11 - Forged Fittings, Socket-Welding and Threaded
- C. Factory Mutual System (FM):
1. Approval Guide, Latest edition.
- D. National Fire Protection Association (NFPA):
1. NFPA 13, 2022 Edition - Installation of Sprinkler Systems.
  2. NFPA 24, 2022 Edition - Standard for the Installation of Private Fire Service Mains and their Appurtenances.
  3. NFPA 70, 2021 Edition - National Electrical Code.

- E. Underwriters Laboratory (UL):
  - 1. UL Fire Protection Directory – Latest Edition.

### 1.3 SUBMITTALS

#### A. Authorities Having Jurisdiction (AHJ)

- 1. Provide Deferred Submittals to AHJ per requirements of 01330. Drawings and calculations have not been submitted to the AHJ for code compliance by Owner's Fire Protection Consultant.
  - a. Submit the following:
    - 1) Product data.
    - 2) Shop drawings.
    - 3) Additional data as may be required by NFPA 13 and Owner's Fire Protection Consultant.

#### B. Submittal Procedure:

- 1. Reference Section 01330 for general submittal procedures. Conform to provisions of Section 01330 unless otherwise specified herein.
- 2. Within 21 days after award of prime contract, send submittals to Owner's Fire Protection Consultant as specified Section 01330. Allow 15 day turn-around on submittals sent to Owner's Fire Protection Consultant.
  - a. Fire Protection Consultant's electronic drawing files (i.e., DWG, DWF, PDF, etc.) will not be provided to the Contractor for the purpose of submittals nor will the Fire Protection Consultant assist with production of submittal information including shop drawings and material data.
  - b. If the Contractor fails to submit a complete Fire Suppression submittal package within 21 days after award of contract, the Contractor shall pay the Owner \$250.00 per day as liquidated damages and not as a penalty, until the fully completed Fire Suppression submittal package is received by Owner's Fire Protection Consultant.
  - c. Send a copy of the Letter of Transmittal sent with the submittals to the Architect indicating date of and content of transmittal.
- 3. Fire Protection Consultant will review electronic file submittal as an alternate to requirements of Section 01330. Obtain the electronic submittal procedure from Owner's Fire Protection Consultant during the Pre-Construction Conference Call.
- 4. Within 21 days after Award of Contract by Owner to Contractor, submit two copies of complete submittals to Authorities Having Jurisdiction if required by Owner's Fire Protection Consultant. Coordinate submittal with Owner's Fire Protection Consultant. Submit additional copies if required.
- 5. Submittals shall be complete, accurate, and in full compliance with contract requirements for proper and timely approval.
- 6. Contractor shall respond to shop drawing review comments within 7 days of receipt.
- 7. Maintain two copies of approved documents on site.

#### C. Submittal Rejection:

- 1. Owner's Fire Protection Consultant will reject submittals which do not comply with Contract Documents. If submittal is rejected by Owner's Fire Protection Consultant for any reason, Owner will back-charge the Contractor \$200.00 via Change Order, to cover the processing costs of each subsequent review until submittal is approved. Submittal rejections include, but are not limited to, the following reasons:
  - a. Design Issues: Incorrect densities, design areas, equipment sprinkler spacing, hose station missing, incomplete system design, etc. No changes in design area, number of sprinklers operating, pipe sizes, number of branch lines, number of mains or deviation of water supply from that shown on the Contract Documents shall be approved by Owner's Fire Protection Consultant. This is not intended to limit the Contractor from making minor modifications to system design for coordination purposes.
  - b. Incorrect Water Test: Failure to use Owner's water test found on project fire protection Construction Documents. No other water test data is permitted for system design submittals to Owner's Fire Protection Consultant.
  - c. Incorrect Material: Do not propose pipe, sprinklers or backflow preventers not indicated in Contract Documents. Products not specified in contract documents are cause for rejection.
  - d. Incorrect Valves: Do not propose OS&Y valves when wall PIV's are indicated in the Contract Documents.

2. Rejected submittals shall be revised and resubmitted until approved. Extension of time will not be allowed for rejected submittals.
  - a. The Fire Suppression subcontractor shall revise and resubmit rejected submittals within 7 days of receipt of rejected submittals.
  - b. The Contractor shall verify that the Fire Suppression subcontractor has addressed all required revisions in the resubmittal.

#### 1.4 Contract Closeout Submittals:

- A. Submit the following under provisions of Section 01770.
  1. Maintenance Data: Include components of system, servicing requirements, inspection data, and operation manuals.
  2. Training Requirements: Provide operational training to Owner. Include system control operation, Fire Pump (if provided) manual and abort functions, trouble procedures, auxiliary functions and emergency procedures.
  3. Contractors Material Test Certificates: Provide Copies of completed Underground, Overhead, and Fire Pump (if applicable) Contractor's Material Test Certificates.
  4. As-Built shop drawings indicating installed location of components, including all piping, sprinklers, hangers, valving, inspector's test stations, auxiliary drains, and hose stations (if required). Cloud all instances deviating from the approved Engineer-issued Contract Drawings or Contractor's Fire Suppression submittal (shop drawings).
  5. Documentation from the local Authority Having Jurisdiction verifying Fire Sprinkler permit has been closed.
- B. At Project completion, present to the Store Manager the as built drawings enclosed in a plastic pipe tube (fixed cap at one end and a threaded cap on the other end) for storage in the Riser Room.
- C. In addition to the copies of Documents delivered to the Store Manager, distribute additional copies of documents as indicated below:
  1. Contractor shall deliver copies of the As-Built shop drawings for Fire Suppression and Contractor's Material Test Certificates (Underground, Overhead, and Fire Pump) in PDF format to Owner's Fire Protection Consultant.

#### 1.5 SYSTEM DESCRIPTION

- A. System shall provide coverage for all existing and new building and expansion areas including, but not limited to, areas scheduled in this Section. Contract Documents have been prepared in accordance with NFPA 13 (working plans) except for fabrication information. The Contract Documents are prepared to a level consistent with that level required by the Authorities Having Jurisdiction to gain plan check approval. No changes in design area, number of sprinklers operating, pipe sizes, number of branch lines, number of mains or deviation of water supply from that shown on the contract documents shall be approved by Fire Protection Consultant. This is not intended to limit the Contractor from making minor modifications to system design for coordination purposes. The Contractor shall review the Contract Documents for completeness and to ensure that the Construction Documents meet all Authorities Having Jurisdiction requirements. Discrepancies with NFPA or Authorities Having Jurisdiction requirements shall be brought to the attention of the Fire Protection Consultant prior to bid. The Contractor shall complete the fire protection Contract Documents to provide all final required detail such as fabrication details, final pipe cuts, hanger cuts, and other miscellaneous details not required by the Authority Having Jurisdiction for approval. Contractor is responsible to coordinate design with all trades and disciplines.
  1. Fire Protection Consultant has submitted Contract Documents to Authorities Having Jurisdiction for review and approval. Contractor shall provide all other documents, qualifications, submittals and coordination necessary to obtain approval by Authorities Having Jurisdiction. All changes made to the Contract Documents by the Contractor shall be submitted to the Fire Protection Consultant for approval prior to fabrication or installation. Refer to Section 01330 for submittal requirements.
- B. Base system design on water flow test data shown on the contract documents.
- C. Authorities Having Jurisdiction may require hydraulically calculated densities, areas of application, and hose allowance differing from those shown or specified. Verify and provide hydraulic calculations per Authorities Having Jurisdiction and these Contract Documents.

- D. Verify actual backflow preventer to ensure correct friction loss is calculated.
- E. Provide fire department connections where required by Authorities Having Jurisdiction.
- F. Sprinklers in light hazard areas shall be quick response type.
- G. Limit each system to 52,000 square feet.
- H. Provide 10 % safety factor between supply curve and demand point, including hose stream allowance.
- I. Provide hangers, supports and earthquake bracing per Contract Documents, NFPA 13, and Authorities Having Jurisdiction.
- J. Interface sprinkler system with fire protection supervisory system.
- K. If required by Authority Having Jurisdiction, provide Fire Department lockbox; quantity, size, type and location as directed.

#### 1.6 QUALITY ASSURANCE

- A. Guarantee system for a period of one year after completion of work and acceptance by Owner.
- B. Qualifications (Installer): Company specializing in performing work of this Section with minimum three years experience and a minimum of a NICET Certified Engineering Technician (Level III) Water-Based Systems Layout Designer on staff responsible for project.
  - 1. Provide technician name, NICET ID Number, state of employment, and certification level on submittal plans.
- C. Company shall have a sprinkler contractor license issued by the Authorities Having Jurisdiction.
- D. Regulatory Requirements: Provide certificate of compliance from Authorities Having Jurisdiction indicating approval of field acceptance tests.
- E. Pre Construction Conference Call: Owner's Fire Protection Consultant as specified in Section 01330 will conduct a Pre-Construction Conference Call. The purpose of the Pre Construction Conference call is to review status of project, notify contractor of status of approvals, and review project expectations. The Contractor shall contact Owner's Fire Protection Consultant within 7 days after Prime Contract award to schedule the Pre Construction Conference Call with the Contractor, Fire Sprinkler Contractor, and Fire Pump Vendor (if applicable). The conference call will be held not more than 30 days after Prime Contract award.

#### 1.7 EXTRA MATERIALS

- A. Provide extra sprinklers under the provisions of NFPA 13. Provide suitable wrenches for each sprinkler type. Provide sprinklers as needed to meet the requirements listed below. Provide a minimum of 2 spare sprinklers for new sprinklers being added that do not match existing.
  - 1. 12 Sales Floor Type
  - 2. 4 Dry Pendent
  - 3. 2 each of other type present for a total of 24.
- B. Provide 2 of each type of dry type sprinklers for the spare head cabinet when replacing or adding dry type sprinklers. Replace any dry type sprinkler that is over 10 years old with a new identical sprinkler.
- C. If needed, provide sprinkler and sprinkler wrench cabinet per NFPA 13, adjacent to sprinkler risers.
- D. Provide hydraulic calculation placard attached to each riser on systems that are modified or added.

#### 1.8 DELIVERY, STORAGE, AND HANDLING



- A. Skid mounted fire pump (Owner Furnished/Contractor Installed): Include in contract amount costs incurred for receiving, storage, and labor. Contractor shall be responsible for costs arising when replacement materials must be reshipped due to loss or damage on job site after acceptance of original shipment. Provide crane to lift skid mounted fire pump from delivery truck to pad.
- B. Obtain manufacturer's information drawings and equipment specifications to assure that the skid mounted fire pump will be received, installed and connected to provide complete installation of system with no damage to components or adjacent work.
- C. Skid mounted fire pump will be delivered in weatherproof packaging. Maintain units in weatherproof condition until building is enclosed.
- D. Deliver, store, and protect products to site under provisions of Section 01600.
- E. Store products in shipping containers and maintain in place until installation. Provide temporary inlet and outlet caps. Maintain caps in place until installation.

## PART 2 - PRODUCTS

### 2.1 OWNER FURNISHED PRODUCTS

- A. Owner's Supplier will furnish sprinkler heads where noted on contract documents as specified in Appendix A (Section 13900) for installation by Contractor.
- B. Descriptions and specifications of Owner furnished products are included as information to Contractor only and are not to be considered as Contractor requirements unless otherwise stated.

### 2.2 MATERIALS

- A. Provide UL Listed (for Fire Protection) or FM Approved (for Fire Protection) materials complying with NFPA 13, unless noted otherwise in Contract Documents.

### 2.3 FIRE PROTECTION PIPING - ABOVE GROUND

- A. Pipe: Steel pipe, conforming to the applicable requirements of NFPA 13, and ASTM A 53, ASTM A 135, or ASTM A 795, as applicable.
  - 1. Wet Pipe Systems, Utilizing Threaded Pipe:
    - a. Schedule 40 black steel pipe.
    - b. Threadable lightwall sprinkler pipe with corrosion resistance ratio of 1.0 or greater after threading.
    - c. Use galvanized pipe, zinc coated externally, outdoors, inside coolers and freezers, or in non-conditioned spaces.
    - d. Where antifreeze solution is permitted for freeze protection, use black steel pipe in lieu of galvanized pipe.
  - 2. Wet Pipe Systems, Utilizing Roll Grooved Pipe.
    - a. Schedule 10 black steel pipe.
    - b. Lightwall sprinkler pipe with corrosion resistance ratio of 1.0 or greater.
    - c. Use galvanized pipe, zinc coated externally, outdoors, inside coolers and freezers, or in non-conditioned spaces.
    - d. Where antifreeze solution is permitted for freeze protection, use black steel pipe in lieu of galvanized pipe.
  - 3. Dry Pipe Systems: Same as wet pipe systems except pipe shall be galvanized, zinc coated externally.
- B. Fittings: Provide one of the following:
  - 1. Cast-Iron Threaded Flanges: ASME B16.1.
  - 2. Cast-Iron Threaded Fittings: ASME B16.4.
  - 3. Malleable-Iron Threaded Fittings: ASME B16.3.

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4. Steel, Threaded Couplings: ASTM A 865.
  5. Steel Welding Fittings: ASTM A 234, ASME B16.9, or ASME B16.11.
  6. Steel Flanges and Flanged Fittings: ASME B16.5.
  7. Steel, Grooved-End Fittings: UL-listed and FM-approved, ASTM A 47, malleable iron or ASTM A 536, ductile iron; with dimensions matching steel pipe and ends factory grooved according to AWWA C606. Roll groove only, cut groove unacceptable.
  8. Steel Fittings and Cast Iron fittings shall not be used for dry pipe systems.
  9. Fitting type shall match pipe. Galvanized fittings shall be used for dry pipe systems
  10. Crimp-type couplings shall not be used.
  11. Plain end fittings (socket, FIT, roustabouts, etc.) shall not be used.
- C. Flexible Piping Systems: At Contractor's option, UL Listed or FM Approved flexible piping connections to sprinklers may be used where suitable for their intended use.
1. Description: Connections shall include a leak-tested sprinkler drop with a minimum internal corrugated hose diameter of 1 inch.
  2. Flexible piping lengths shall not exceed 6 feet.
  3. Installation shall not exceed the minimum bend radius and maximum allowable bends as specified by the manufacturer.
  4. Change in direction shall be gradual enough to allow flexible piping to bend without crimping, distorting or reducing internal diameter.

## 2.4 SPRINKLERS

- A. Replace any existing sprinkler that has signs of leakage, paint applied (other than by the sprinkler manufacturer), corrosion, damage, or loading; or is installed in the improper orientation. Provide new sprinkler with identical K-Factor, temperature rating, and response type as the existing.
- B. Subject to compliance with requirements, provide UL Listed or FM Approved automatic sprinklers. Provide sprinklers with nominal K-factor as indicated on Contract Documents. Sidewall sprinklers are not acceptable, unless noted otherwise. Provide the following sprinkler types:
1. Areas With Exposed Structure Above: Upright or pendent sprinkler, bronze.
  2. Areas With Gypsum Board Ceilings: Pendent sprinkler, white, with two-piece white escutcheon plate.
  3. Areas With Lay-in Ceilings: Pendent sprinkler, white, with two-piece semi-recessed white escutcheon plate.
- C. Standard Sprinklers: Tyco Fire Products sprinklers and sprinkler accessories must be provided unless noted otherwise in the contract documents.
1. Glass bulb sprinklers are acceptable.
  2. Sprinklers with O-rings not permitted.
  3. Substitutions: Not Permitted, except Viking VK595 is permitted where TY9128 is specified on contract documents.
- D. For projects that require seismic bracing, install ceiling sprinklers per one of the following:
1. Install sprinklers with flexible piping.
  2. Provide one inch clearance around sprinkler. Cover the larger opening by installing either a Recessed Canopy Coverage Extension or Kydex Ring by Fire Protection.

## 2.5 ACCESSORIES

- A. Control Valve Supervisory Switches:
1. Provide new post indicator valves with tamper switches, Model No. PCVS-2, as manufactured by Potter Electric Signal of St. Louis, Missouri. Installed by the sprinkler contractor, monitored by the fire alarm contractor.
  2. Provide new outside screw and yoke valves with tamper switches, Model No. OSYSU-2 as manufactured by Potter Electric Signal of St. Louis, Missouri. Installed by the sprinkler contractor, monitored by the fire alarm contractor .
  3. Provide new ball type control valves leading to alarm initiating devices, Model No. RBVS, as manufactured by Potter Electric Signal of St. Louis, Missouri. Installed by the sprinkler contractor, monitored by the fire

alarm contractor.

4. All other new valves capable of controlling water to the Fire Protection Sprinkler systems shall have appropriate tamper switches. Installed by the sprinkler contractor, monitored by the fire alarm contractor.

B. Wire Cage Sprinkler Guards:

1. Provide guards on pendent sprinklers located within 7'-6" of finished floor, except for recessed and concealed sprinklers.
2. Provide guards on sprinklers located beneath overhead doors.

C. Automatic Air Vent: Provide one automatic venting air vent on each wet pipe sprinkler system, as manufactured by Engineered Corrosion Solutions Model Ejector Automatic Air Vent or SouthTek Model Dual Vent O<sub>2</sub> Release System.

D. Substitutions: Not permitted.

## 2.6 FIRE PUMP

A. Fire Pump not permitted.

## PART 3 - EXECUTION

### 3.1 GENERAL INSTALLATION REQUIREMENTS

- A. Install system and equipment in accordance with NFPA 13 and manufacturer's instructions.
- B. Replace with an identical K-Factor, temperature rating, and response-type any sprinkler that has signs of leakage, paint applied other than by the sprinkler manufacturer, corrosion, damage, or loading; or is installed in the improper orientation.

### 3.2 INSTALLATION - ABOVE GROUND PIPING

- A. Provide piping in accordance with NFPA 13.
- B. Locate top beam clamp or thru bolt connection near joist panel points per pipe support detail.
- C. Hangers must be bolted through the top chord of joists within 6 in of joist panel point.
- D. Parallel to Joist Installation: A 2 in x 2in x ¼ in square washer and nut is required above top chord of joist; fender washers are not allowed. Piping routed parallel to joists must not be closer than 1 ft to the joist centerline. Do not locate two or more pipes 4 inch or larger between the same joists.
- E. Provide piping to conserve building space. Do not interfere with use of building space and other work.
- F. Group piping whenever practical at common elevations.
- G. Prepare pipe, fittings, supports, and accessories for finish painting. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding. Protect sprinkler to ensure sprinklers do not receive field paint. Remove protective covering after painting. Replace sprinklers having paint other than factory finish with new sprinklers. Cleaning and reuse of painted sprinklers is prohibited.
- H. Examine other work indicated on the Drawings and conditions at job site. Coordinate routing of work with other construction trades to avoid interference with other installations. Do not cut building structural members, beams, joists, etc. for routing of sprinkler piping.
- I. Seal pipe penetrations through fire rated walls or floors to achieve fire resistance equivalent to fire separation required.

- J. Provide wall plates at all pipe penetrations. Provide zinc coated (galvanized) wall plates at exterior penetrations.
- K. Provide zinc coated (galvanized) all-thread rod for hanging dry system piping.
- L. Provide valves with stems upright or horizontal.
- M. Route piping and locate sprinklers as required to avoid building structure, equipment, plumbing piping, heating and air conditioning piping, ductwork, lighting fixtures, electrical conduits and bus ducts, and similar work. Locate center of sprinkler a minimum of 6 inches off ceiling grid.
  - 1. Final location of lighting and exposed ductwork shall have priority over pipe routing and final sprinkler locations.
  - 2. Sprinkler piping in sales area without a ceiling and stockroom shall be located above bottom of joists. Minimum height of sprinkler piping in areas with ceilings shall be 1'-0" above ceiling.
- N. Relocate inspector's test valves as required for new building and merchandise layout. Locate at five feet minimum to seven feet maximum above finish floor. Provide one inspector's test valve for each system at end-of-the-line, piped to non-public areas at location indicated on Contract Documents.
- O. Provide pressure relief valves on gridded wet pipe systems.
- P. Provide protection from freezing for sprinkler piping exposed to freezing conditions per Contract Documents and NFPA 13.
- Q. Provide valves, backflow prevention devices, check valves, automatic air vents, and drains per Contract Documents and Authorities Having Jurisdiction.
  - 1. Install automatic air vents at accessible locations shown on Contract Documents. Install vent at the highest point possible on each system. Accessible locations are above areas without ceilings and areas with access panels. Areas above lay-in ceilings are not considered accessible.
- R. Use full lengths of pipe except where needed to accommodate changes in direction or for space limitations.

### 3.3 IDENTIFICATION

- A. Apply signs to control, drain, test and alarm valves to identify their functions. Provide lettering sizes and styles per Authorities Having Jurisdiction. Provide etched, embossed, or engraved hydraulic placard permanently attached by chain or adhesive for each sprinkler system in accordance with NFPA 13. Stencil riser/zone numbers on risers.
- B. Provide or replace a sprinkler zone map and general information sign in accordance with NFPA 13. Contractor to verify and identify the following: areas protected, control valves, dry pipe valve, inspector's test valves, auxiliary drains, pumps, and tanks. Sprinkler Zone Map and general information sign shall be laminated in plastic. Permanently attach to wall in fire sprinkler riser room. Provide lettering sizes and styles per Authorities Having Jurisdiction.

### 3.4 FIELD QUALITY CONTROL

- A. General: Contractor shall schedule, coordinate and conduct all tests required by Authorities Having Jurisdiction and Owner's Fire Protection Consultant. Contractor shall modify, replace or retest as required by Authorities Having Jurisdiction and / or Owner's Fire Protection Consultant.
- B. Flush, test, and inspect sprinkler system according to NFPA 13 "Systems Acceptance" Chapter. Test the systems, including the underground water mains, and the aboveground piping and components to assure that equipment and components function as intended. Pressure test the systems in accordance with NFPA 13 and NFPA 24. The Contractor shall have available copies of as-built drawings.
  - 1. Above Ground Fire Protection Piping:
    - a. Test per NFPA 13.
    - b. Inspect welds and verify welder's qualifications per Authorities Having Jurisdiction.
    - c. Perform Hydrostatic tests per NFPA 13.

2. Backflow Prevention Assembly Forward Flow Test.
  3. Operation of control valves and flowing of inspector's test connections to verify operation of alarm devices including alarm switches. After operation of control valves has been completed, assure that control valves are in the open position.
  4. Main Drain flow test.
- C. Fire Sprinkler System Construction Follow Up: Owner's Fire Protection Consultant (as specified in Section 01330) will conduct a Pre-Construction Conference Call and Fire Sprinkler Site Observation and Acceptance Test (FPAT). The purpose of the Pre Construction Conference call is to review status of project, notify contractor of status of approvals, and review project expectations. The purpose of the Fire Sprinkler System Site Observation is to determine if the new or remodeled fire sprinkler systems are in general conformance with Contract Documents and shop drawings. The Contractor shall coordinate with Owner's Fire Protection Consultant for the time and date of the test. Scheduling for the FPAT shall begin 21 days prior to Construction End Date with FPAT being conducted one to two weeks prior to Construction End Date. The FPAT shall occur prior to Construction End Date. A representative sample checklist is available upon request.
1. Pre Construction Conference Call: The Contractor shall contact Owner's Fire Protection Consultant within 2 days after Contract Award to schedule the Pre Construction Conference Call with the Contractor, Fire Sprinkler Contractor, and Fire Pump Vendor (if applicable). The conference call will be held within 7 days after Award. FPAT will be preliminarily scheduled at time of Pre Construction conference call.
  2. FPAT: Owner's Fire Protection Consultant will meet the Contractor, and Sprinkler Contractor. Contractor shall invite Alarm Central representatives to the test, but their presence is not required. At scheduled time, Contractor/Sprinkler Contractor shall be ready to initiate Acceptance tests as outlined herein. Prior to initiating tests, the following information shall be reviewed and copies provided to Owner's Fire Protection Consultant:
    - a. Contractors Materials and Test Certificate for Above Ground Piping (By System). As a minimum, the form shall contain information indicated in sample form shown in NFPA 13 (i.e. Figure 16.1 of 2002 edition). Complete all certificates and verify all information except dry pipe test section and hydrostatic test section. Dry pipe section may be completed during Acceptance Test. Hydrostatic test may be completed in the future and a copy forwarded to Owner's Fire Protection Consultant at a later date.
    - b. Sprinkler Zone Map.
    - c. Approved Shop Drawings.
    - d. Fire Pump Factory Test Curve (if applicable).
  3. After these documents have been reviewed, Acceptance Test shall be initiated by Contractor/Sprinkler Contractor in the order determined by Owner's Fire Protection Consultant. Each of these tests shall be interfaced with the fire alarm system. Contractor shall arrange for system to be put in test and arrange to be able to silence local alarms during Acceptance Test. Contractor shall coordinate with Alarm Central. The Contractor shall provide all personnel, material, equipment, lifts, air and water pumps, hand tools, and apparatus necessary to complete the above required testing. The Contractor shall notify the store management that the above tests are scheduled.
  4. The following tests shall be conducted by the Contractor / Sprinkler Contractor and witnessed by Owner's Fire Protection Consultant. Generally this is the order the tests shall be conducted, but the Owner's Fire Protection Consultant may require tests be conducted in any order deemed appropriate. Determination of order will be made while on site.
    - a. Fire Pump Systems (if applicable): Sprinkler Contractor shall conduct a full NFPA 20 acceptance test, including (but not limited to) flow (churn, 100%, and 150%), manual and automatic starts, etc. Sprinkler Contractor shall provide all equipment and personnel necessary to conduct test. Verify flushing and pre-start preparation prior to test. Typically, this is the first test in the Acceptance Test.
    - b. Water Storage Tank (if applicable): Sprinkler Contractor shall drop water level, overflow tank, and operate tank heaters. Typically, this is the second test in the Acceptance Test.
    - c. Dry pipe Systems: Sprinkler Contractor shall operate dry system to verify High, and Low air pressure settings as well as water delivery time. This test typically follows the Fire Pump/Tank test depending on site conditions.
    - d. Inspector's Test: Sprinkler Contractor shall operate each Inspector's Test to verify flow switch operates within 90 seconds (preferred time is 45 seconds, minimum time is 30 seconds). This test typically follows the Dry pipe system Acceptance Test.
    - e. System Control Valves: Sprinkler Contractor shall operate each system control valve to verify functionality. This test typically follows the Inspector's Test Acceptance Test.

- f. Antifreeze Systems (if applicable): Sprinkler Contractor shall test antifreeze mixture to verify proper solution ratio. This test typically follows the System Control Valve Acceptance Test.
  - g. Hydrostatic Test: Sprinkler Contractor shall hydrostatically test all systems individually. Typically this will be the last test initiated, and depending on schedule may not be fully witnessed by Owner's Fire Protection Consultant. Contractor/Sprinkler Contractor shall certify and provide signed off copies of test certificates proving successful completion of Hydrostatic tests prior to full acceptance.
5. In addition to conducting the Fire Protections Systems Acceptance Test, a Fire Sprinkler System Site Observation of the installed systems will also be conducted. Owner's Fire Protection Consultant will conduct and document a site observation of the fire sprinkler systems (and fire pump / tank as applicable). At the conclusion of this Observation, an exit interview will be conducted with the Contractor to review and identify issues that need correction prior to acceptance of the system.
- D. Replace sprinkler system components that do not pass test procedures and retest to demonstrate compliance. Repeat procedure until satisfactory results are obtained. The installation shall not be considered accepted until identified discrepancies have been corrected and test documentation is properly completed and received. If FPAT is required to be repeated or rescheduled due to unsatisfactory results rescheduling could take up to four weeks, and may result in Contractor being back charged for Owner's Fire Protection Consultant additional time and expenses.
- E. Upon completion of scope of work and prior to interior store finishing, test above ground pressure piping for leakage in presence of Authority Having Jurisdiction and Owner's representative. Maintain test pressure at the high end for two hours. Test pressure: 200 psi or 50 psi over normal operating pressure, whichever is greater. Conduct test in accordance with NFPA 13, Hydrostatic Tests. Submit documentation per Contract Closeout Submittals of this section and 01770.
- F. Provide a copy of the fire sprinkler permit indicating completion of the scope of work shown on contract documents and acceptance by the Authority Having Jurisdiction.

END OF SECTION

## SECTION 14580 (14 9200) – PNEUMATIC TUBE SYSTEM

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Owner furnished and installed Pharmacy Pneumatic Tube System including vehicle sensor and alert system.
- B. Related Requirements: The following list is intended to aid in locating work related to or dependent on the scope of Work in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
  - 1. Appendix A – Products and Work by Owner or Separate Contractor: Manufacturers, suppliers, product descriptions, installation, and general procedures related to Owner furnished products.

## 1.2 SUBMITTALS

- A. Shop Drawings: Owner’s Supplier/Installer will submit in accordance with Section 01330 and as described in Appendix A (Section 14580).
- B. High Wind Requirement: Owner’s Supplier/Installer will submit documentation verifying system meets or exceeds wind requirement for review by Structural Engineer.
- C. Owner’s Supplier/Installer will submit shop drawing for the pneumatic tube system as prepared by Owner’s pneumatic system manufacturer:
  - 1. Do not accept reproductions of Contract Documents as shop drawings.
  - 2. Owner’s installer will submit within 30 days of contract award.
  - 3. Owner’s Shop Drawings will indicate the following:
    - a. Profiles, layout, sizes, spacing, and locations of pneumatic tubes.
    - b. Submit 2 additional sets of shop drawings which shall be retained by the General Contractor.
- D. Test and Inspection Reports: Owner’s Supplier/Installer will submit reports of the following tests and inspections conducted at the site as specified.
  - 1. Visual examination.
  - 2. Transmission tests.
- E. Closeout Submittals: Owner’s Supplier/Installer will provide the following documentation for Contractor’s Close-out submission. Submit in accordance with Section 01770.
  - 1. Manufacturer’s descriptive literature.
  - 2. Operation and Maintenance Data: Include operating instructions, maintenance and repair data.
  - 3. Spare parts data.

## 1.3 SCHEDULING AND COORDINATION

- A. Contact Owner’s Installer within 15 working days after award of Contract to coordinate installation work.
- B. System requirements vary by system Manufacture and Model. Require shop drawings from Owner’s system manufacturer’s as described herein and coordinate rough opening dimensions with Owner’s Installer.
- C. Coordinate with Owner’s Installer for millwork placement if millwork is not installed prior to pneumatic tube system.
- D. Schedule Owner’s pneumatic tube installation to begin after complete installations of prerequisite work, including:
  - 1. Electrical work.

2. Wall penetrations.
3. Exterior canopies
4. Trapeze supports.
5. Data conduits with pull wire.
6. Curbs.
7. Blower rooms (where shown on Drawings).
8. Canopies.

## PART 2 - PRODUCTS

### 2.1 OWNER FURNISHED PRODUCTS

- A. Owner's Suppliers will furnish and install equipment within the scope of this Section as specified in Appendix A (Section 14580).

### 2.2 PHARMACY PNEUMATIC TUBE SYSTEM

- A. Power Requirements: Provide electrical circuiting, conduit, boxes, and all appurtenances required for a complete installation of pathway to accommodate control and communications wiring for Blower Units, Customer Units, and AV Hub/Equipment. Location and termination of conduits and/or boxes shall be as shown on the Electrical Drawings and as required by Owner's system manufacturer.
  1. Blower Units: Provide one dedicated 120V, 20A circuit per blower pack to one duplex outlet at blower location as required by system manufacturer. Refer to electrical drawings for location.
  2. Customer Unit: Provide dedicated 120V, 20A circuit and conduit to exterior customer unit as required by electrical drawings and Owner's system manufacturer. Coordinate final connections with system manufacturer.
  3. AV Hub and Cabinet:
    - a. Provide one dedicated quad outlet unit in location shown on Drawings for relocation of AV hub when moving the pneumatic tube system.
    - b. Coordinate new location with system manufacturer.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify dimensions, tolerances, and method of installation of pneumatic tube system.

### 3.2 INSTALLATION

- A. Provide preparations as necessary for installation of the system by Owner's Installer including tube supports; wall penetrations; flashing; blower rooms or cabinets (if shown on Drawings); and conduit for electrical power, control wiring, and audio/video cabling.
- B. Provide appurtenant and associated construction if shown or noted on the Drawings.
- C. If project includes system relocation, provide demolition of existing system as shown or noted on the Drawings. Coordinate the following with Owner's Installer:
  1. Verify that Owner's Installer does not reuse system tubes or components.
  2. Verify clear path and available space for new location.
  3. Verify Owner's Installer relocates existing under-counter AV hub to a wall below the ceiling near Associate Unit.
- D. Suspend tubing and bends as shown on Drawings with supports spaced not more than ten feet on center. Install tubes straight, level and plumb. Avoid running tubing under lighting and skylights whenever possible. Secure tubes in place and brace against motion caused by passage of carriers.



- E. Seal tubing connections with approved compound. Avoid formation of beads or ridges on the inside at connections. Wipe outside surfaces clean of surplus compound.
- F. Owner's Installer will provide installation in accordance with system manufacturer's written requirements and the requirements in Appendix A (Section 14580).
- G. Verify Owner's Installer installs receivers in location shown on Drawings. Do not allow deviation without written approval from Owner's Pharmacy Operations.
  - 1. Capture photographs of receiver installation and location and make photos available to Owner upon request.

### 3.3 FIELD TESTING

- A. In the presence of Contractor, Owner's Installer will perform operational tests as specified in Appendix A (Section 14580).

END OF SECTION

## SECTION 15050 - BASIC MECHANICAL MATERIALS AND METHODS

## PART 1 - GENERAL

## 1.1 SUMMARY

## A. Section Includes:

1. Hangers and Supports: Pipe supports.
2. Mechanical equipment labels

## B. Related Section:

1. Section 13900 - Fire Suppression: Fire Protection Sprinkler system piping.
2. Section 15100 - Building Services Piping: Domestic water, reverse osmosis, sanitary drain and vent, interior storm water, and condensate piping. Piping Insulation. Pipe freeze protection.
3. Section 15190 - Fuel Gas Piping: Natural and LP gas piping.
4. Section 15600 – Refrigeration Systems.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. American Society of Mechanical Engineers (ASME):
  1. ASME B31.9 – Building Services Piping.
- C. Cast Iron Soil Pipe Institute (CISPI):
  1. Cast Iron Soil Pipe and Fittings Handbook.
- D. Manufacturers Standardization Society of The Value and Fittings Industry Inc. (MSS):
  1. MSS SP – 69 – Pipe Hangers and Supports – Selection and Application.
  2. MSS SP – 89 – Pipe Hangers and Supports – Fabrication and Installation Practices.

## 1.3 QUALITY ASSURANCE

- A. Comply with rules and regulations of public utilities and municipal department affected by connection of services.
- B. Laws, codes, and ordinances shall take precedence except where work called for by Drawings and Specifications exceeds code requirements in quality or quantity.

## 1.4 CONSTRUCTION DOCUMENTS

- A. Drawings and Specifications show pipe and duct sizes, general routing and location, and describe various systems. These documents describe equipment, including size, general location, usage, support, and auxiliary requirements. Contract Documents do not, however, detail certain job requirements. Drawings are intended to cover layout and design of the Work and are not to be scaled for exact measurements. Where specific detail and dimension for mechanical Work are not shown on Drawings, take measurements and make layouts as required for proper installation of mechanical Work in coordination with other Work on project.

## 1.5 DELIVERY, STORAGE AND HANDLING

- A. Follow manufacturer's published directions in the delivery, storage, protection, installation, piping, and wiring, and start-up of equipment and materials.

## PART 2 - PRODUCTS

## 2.1 HANGERS AND SUPPORTS

- A. Pipe Hanger Schedule: Pipe hangers, except for fire suppression piping, shall be as specified in Schedule I at the end of this Section. Trapeze hangers for multiple parallel pipes shall be installed as shown on the drawings.
- B. Hangers and supports for fire suppression piping shall be as shown on the drawings.
- C. Wall Support for Pipe Sizes to 3 Inches: Steel riser clamp.
- D. Wall Support for Pipe Sizes 4 Inches and Over: Welded steel bracket and wrought steel clamp, adjustable steel yoke and cast iron roll for hot pipe sizes 6 inches and over.
- E. Vertical Support: Steel riser clamp.
- F. Provide copper plated hangers and supports for uninsulated copper piping. Provide plastic inserts for uninsulated copper piping penetrating metals studs.

## 2.2 EQUIPMENT LABELS

- A. Provide label for each type of mechanical equipment installed on the project.
- B. Provide equipment labels as specified below unless otherwise required in the individual sections for the specific piece of equipment specified.
- C. Labels:
  - 1. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving 1/16 thick, and having predrilled holes for attachment hardware.
  - 2. Letter Color: White.
  - 3. Background Color: Black.
  - 4. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
  - 5. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
  - 6. Attachment: Either of the following
    - a. Fasteners: Stainless-steel self-tapping screws.
    - b. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- D. Asset Tags:
  - 1. Scan the QR code below to locate and order self-adhesive Walmart asset tags from the vendor Camcode.
  - 2. Install Walmart asset tags on equipment.



- 3. Data Collection Application: Scan the QR code below to locate and download the Asset Data Collection Application.



4. Asset Information: Using the Asset Data Collection App, scan the asset tag of new equipment. Input the store number and data as prompted in the Asset Data Collection App.

## PART 3 - EXECUTION

### 3.1 HANGERS AND SUPPORTS

- A. Support pipes throughout building, both horizontally and vertically in accordance with requirements herein and as shown on the drawings. Attach to building structure overhead as shown on drawings. Do not attach to ceilings, equipment, ductwork, conduit, floor, roof decking, or any other non-structural elements. Do not use fasteners which penetrate the roof deck.
  1. Provide sway bracing if required to comply with code seismic requirements.
- B. In areas without ceilings, secure insulation shields to insulation with pressure sensitive tape at each end of shield.
- C. Hangers for PEX or polypropylene (PP) pipe shall be suitable for the type of pipe used and designed to prevent gouging of the pipe. Verify with manufacturer of the hangers and/or clamps that hanger or clamp products are compatible with PEX or PP piping. Fasteners shall be approved by the pipe manufacturer.
- D. Hanger and clamps sizing:
  1. Cold Piping: Provide pipe hangers sized for the pipe outside diameter plus insulation thickness.
  2. Hot Piping: Provide pipe hangers sized for the pipe outside diameter.
  3. Vertical Piping: Provide clamps sized for the pipe outside diameter and extend clamp through insulation.
  4. Refer to Section 15100 for definition of hot and cold piping and required insulation thickness.
- E. Piping Support Spacing: Support horizontal piping above slab, except fire suppression piping, as shown in Schedules I-III at the end of this Section.
  1. Support fire suppression piping at spacing as shown on the Fire Protection (FP) drawings.
- F. Install hangers to provide minimum 1/2 inch clear space between finished covering and adjacent work.
- G. Support piping within 12 inches of each elbow or tee.
- H. Support vertical pipe runs at roof, at floor, and at maximum 10-foot intervals.
- I. Space supports not more than five feet apart at valves, strainers or piping accessories larger than 2 inches.
- J. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units. Provide expansion devices as required for the specific piping material used.
- K. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories. Provide two nuts on threaded supports to securely fasten the support.
- L. Comply with the requirements of Section 09900 for field painting and touch-up.

### 3.2 ADJUSTING

- A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.
- B. Load Distribution: Adjust hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.
- C. Pipe Slopes: Adjust hangers and supports to provide indicated pipe slopes and to not exceed maximum pipe deflections allowed by ASME B31.9 for building services piping.
- D. Trim excess length of continuous-thread hanger and support rods to 1-1/2 inch.

### 3.3 OPERATION PRIOR TO ACCEPTANCE

- A. Contractor may operate any equipment provided that the operation is supervised and the Contractor retains full responsibility for properly maintaining equipment and the full manufacturers warranty remains unaffected from the time of Owner's possession.

### 3.4 EQUIPMENT LABEL INSTALLATION

- A. Install or permanently fasten labels on each major item of mechanical equipment.
- B. Locate equipment labels where accessible and visible.
- C. Where equipment, such as VAV boxes, is concealed by accessible drop or lay-in ceilings or other accessible barrier, attach label to ceiling grid or a visible location to identify location of hidden equipment.

### 3.5 SCHEDULES: Schedules below apply to all piping, except fire suppression piping, hung inside the building.

SCHEDULE I - PIPE HANGER SCHEDULE						
Pipe Service	Pipe Size	Hanger Type	B-Line No.	Globe No.	Grinnell No.	PHD
Uninsulated Steel or PVC or CPVC	2" & smaller	Split Ring	B-3173 with B-3224	721	108 with 114	500 with 114
	2-1/2" & larger	Clevis	B-3100	404/407	260	450
Uninsulated Copper	2" & smaller	Ring	B-3170-CT	301	CT 99	152
	2-1/2" & larger	Clevis	B-3104-CT	407	CT 65	442
Cast Iron Soil Pipe	All	Clevis	B-3102	404	260	420
Insulated Steel, PVC, PEX, or PP	2" & smaller, 2 1/2" & larger	Clevis	B-3100 with shield	404 with shield	260 with shield	450 with shield
Insulated ABS (Glycol Refrigeration Piping Only)	2" & smaller, 2 1/2" & larger	Clevis	B-3100 with shield	404 with shield	260 with shield	450 with shield
Insulated Copper	2" & smaller	Clevis	B-3104 with shield	411 with shield	CT 65 with shield	442 with shield
	2 1/2" & larger	Clevis	B-3100 with shield	408 with shield	260 with shield	442 with shield

SCHEDULE II - PIPING SUPPORT SCHEDULE							
Maximum Spacing In Feet							
Copper	Steel	Cast Iron	PVC	PEX	Polypropylene (PP)	ABS (Glycol Refrigeration Piping Only)	CPVC
6' max up to 1-1/4" I.D.	12' max	5' max, except may be 10' max where 10' lengths are installed.	4' max	32" max	32" max up to 1"	3' max up to 1-1/2" I.D.	3' max up to 1" I.D.
10' max all other		Min one hanger at each joint.					

SCHEDULE III - PIPING SUPPORT SCHEDULE (GAS PIPE)	
Maximum Spacing In Feet	

Pipe I.D.	Steel
1/2"	6'
3/4" or larger	8'

END OF SECTION

## SECTION 15100 - BUILDING SERVICES PIPING AND EQUIPMENT

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
1. Under-building slab and aboveground domestic water pipes, tubes, fittings, and specialties inside the building.
  2. Water piping.
  3. Sanitary waste and vent piping.
  4. Air conditioning condensate piping.
  5. Owner furnished water piping specialties for installation by Contractor.
  6. Owner furnished roof and floor drains, cleanouts, and accessories for installation by Contractor.
  7. Pipe freeze protection.
  8. Connection of miscellaneous equipment furnished under other Sections.
- B. Related Requirements: The following list is intended to aid in locating products and work related to or dependent on the scope in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
1. Appendix A – Products and Work By Owner or Separate Contractor: Manufacturers, suppliers, product descriptions, installation (if applicable), and general procedures related to Owner furnished products.
  2. Section 02320 – Excavating, Backfilling, and Compacting.
  3. Section 07530 – Elastomeric Membrane Roofing.
  4. Section 07620 - Sheet Metal Flashing and Trim: Flashing of roof penetration.
  5. Section 11140 - Vehicle Service Equipment: Automotive Center piping.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.
- B. American Society of Mechanical Engineers (ASME):
1. ASME A13.1 - Scheme for the Identification of Piping Systems.
- C. American National Standards Institute (ANSI):
1. ANSI B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings.
  2. ANSI B16.22 - Wrought Copper & Copper Alloy Solder-Joint Pressure.
- D. American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE):
1. ASHRAE 90.1 - Energy Efficient Design of New Buildings Except New Low-Rise Residential Buildings.
- E. ASTM International (ASTM):
1. ASTM A53 - Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
  2. ASTM A74 - Hub and Spigot Cast Iron Soil Pipe and Fittings.
  3. ASTM A536 - Ductile Iron Castings.
  4. ASTM A861 - High-Silicon Iron Pipe and Fittings.
  5. ASTM A888 - Hubless Cast Iron Soil Pipe and Fittings.
  6. ASTM B75 - Seamless Copper Tube.
  7. ASTM B88 - Seamless Copper Water Tube.
  8. ASTM B135 - Seamless Brass Tube.
  9. ASTM B306 - Copper Drainage Tube (DWV).
  10. ASTM B584 - Copper Alloy Sand Castings for General Applications.
  11. ASTM C564 - Rubber Gaskets for Cast Iron Soil Pipe and Fittings.
  12. ASTM C921 - Determining the Properties of Jacketing Materials for Thermal Insulation.



13. ASTM C1277 - Shielded Couplings Joining Hubless Cast Iron Soil Pipe and Fittings.
  14. ASTM C1540 - Heavy Duty Shielded Couplings Joining Hubless Cast Iron Soil Pipe and Fittings.
  15. ASTM D1785 - Poly vinyl Chloride (PVC) Plastic Pipe, Schedules 40, 80, and 120.
  16. ASTM D2000 - Standard Classification System for Rubber Products in Automotive Applications.
  17. ASTM D2321- Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.
  18. ASTM D2467- Polyvinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 80.
  19. ASTM D2564 - Solvent Cements for Polyvinyl Chloride (PVC) Plastic Pipe and Fittings.
  20. ASTM D2609 - Plastic Insert Fittings for Polyethylene (PE) Plastic Pipe.
  21. ASTM D2665 - Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings
  22. ASTM D2855 - Making Solvent-Cemented Joints with Polyvinyl Chloride (PVC) Pipe and Fittings.
  23. ASTM D3311 - Drain, Waste, and Vent (DWV) Plastic Fittings Patterns
  24. ASTM E84 - Surface Burning Characteristics of Building Materials.
  25. ASTM E96 - Water Vapor Transmission Materials.
  26. ASTM F439 - Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80.
  27. ASTM F441 - Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 And 80.
  28. ASTM F493 - Solvent Cements for CPVC Pipe and Fittings.
  29. ASTM F656 - Primers For Use in Solvents Cement Joints of Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings.
  30. ASTM F876 - Crosslinked Polyethylene (PEX) Tubing.
  31. ASTM F877 - Crosslinked Polyethylene (PEX) Plastic Hot and Cold Water Distribution Systems.
  32. ASTM F1807 - Metal Insert Fittings Utilizing a Copper Crimp Ring for SDR9 Cross-linked Polyethylene (PEX) tubing.
  33. ASTM F1960 - Cold Expansion Fittings with PEX Reinforcing Rings for Use with Cross-linked Polyethylene (PEX) Tubing.
  34. ASTM F2014 - Non-Reinforced Extruded Tee Connections for Piping Applications.
  35. ASTM F2023 –Test Method for Evaluating the Oxidative Resistance of Plastic Piping to Hot Chlorinated Water.
  36. ASTM F2098 - Stainless Steel Clamps for Securing SDR9 Cross-linked Polyethylene (PEX) Tubing to Metal Insert Fittings.
  37. ASTM-F2389 – Pressure-rated Polypropylene (PP) Piping Systems.
- F. American Water Works Association (AWWA):
1. AWWA C104 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
  2. AWWA C115 - Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.
  3. AWWA C151 - Ductile-Iron Pipe, Centrifugally Cast.
  4. AWWA C651 - Disinfecting Water Mains.
- G. CSA Group (Canadian Standards Association)
1. CSA B137.11 - Polypropylene (PP-R) Pipe and Fittings for Pressure Applications.
- H. Hydraulic Institute (HI):
1. HI M103 (ANSI/HI 1.4) - Centrifugal Operations.
- I. International Association of Plumbing and Mechanical Officials (IAPMO)
1. IAPMO/ANSI Z1001- Prefabricated Gravity Grease Interceptors.
- J. NSF International (NSF):
1. NSF 14- Plastic Piping System Components and Related Materials.
  2. NSF 51 – Food Equipment Materials
  3. NSF 61 – Drinking Water System Components-Health Effects.
  4. NSF 61 Annex G - Weighted Average Lead Content Evaluation Procedure to a 0.24 Percent Lead Requirement.
- K. Plumbing and Drainage Institute (PDI):
1. PDI WH 201- Water Hammer Arrestors.

- L. Underwriters Laboratories (UL):
  - 1. UL 778 – Motor-Operated Water Pumps.

### 1.3 SUBMITTALS

- A. Comply with the requirements of Section 01330.
- B. Product Data: Submit product data and installation details for grease interceptor to Authority Having Jurisdiction for approval. Include rated capacities, operating characteristics, and accessories.
- C. Water Samples: Submit to Authorities Having Jurisdiction in accordance with the requirements of Cleaning and Disinfection paragraph in Part 3.

### 1.4 CLOSEOUT SUBMITTALS

- A. Submit the following as described in the testing and inspection requirements in Part 3 below as a part of closeout submittals in accordance with Section 01770.
  - 1. Video Inspection Report: Furnish one copy of Video Inspection Report to Owner’s Construction Manager within one week after completion of inspection.
  - 2. Certification: Provide statement of certification of the following:
    - a. Statement of completion that Work is in accordance with specified requirements.
    - b. Name and signature of General Contractor.
    - c. Names and signatures of Video Inspection Contractor.
  - 3. Polypropylene Pipe Warranty.

### 1.5 QUALITY ASSURANCE

- A. Domestic Water Supply Copper Piping Assembly Installer Qualifications: If Contractor provides any of the optional domestic water supply copper piping assembly systems specified in Part 2, Installer shall be a certified installer of system provided.
- B. Installers of polypropylene pipe shall be factory certified and trained by pipe manufacturer. Installers shall have certificates of training available for review.
- C. Regulatory Requirements:
  - 1. Lead-Free Compliance: Domestic water piping and fittings, pumps, water piping specialties and specialty plumbing fixtures shall comply with the requirements of NSF 61 Annex G.

### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Transport and handle products in compliance with the requirements of Section 01600.
- B. Store and protect products in compliance with the requirements of Section 01600.
- C. Product Delivery:
  - 1. Owner’s Supplier will deliver Owner furnished products to site to be received by Contractor. Contact Owner’s Supplier to coordinate product delivery and installation.
  - 2. Schedule delivery of items to installation areas that are in proper condition to receive them. Place items neatly and systematically to avoid damage, store in clean, dry, enclosed, and secure storage area.
  - 3. Receive Owner Furnished products in compliance with the requirements of Section 01600.
- D. Acceptance at Site:
  - 1. Inspect Owner furnished products upon delivery of products to Site to verify quantity of products furnished and report to Owner discrepancies in quantity delivered or obvious damage to products delivered to the site.
  - 2. Inspect materials delivered and reject those not qualifying with requirements, those damaged in transit, or those that appear otherwise unsatisfactory.

- E. Polypropylene piping shall remain in its UV resistant packaging until ready to be installed. If the piping is to be exposed to the sun for more than 30 days, take appropriate measures to protect the pipe from UV radiation.

## 1.7 WARRANTY

- A. Provide manufacturer's warranty for polypropylene pipe and fittings for 10 years to be free of defects in materials or manufacturing.
- B. Warranty shall cover labor and material costs of repairing or replacing defective materials and repairing any incidental damage caused by failure of the piping system due to defects in materials or manufacturing.
- C. Contractor shall submit to the manufacturer, the pressure/leak test documentation indicating that the system was tested and passed the manufacturer's pressure/leak test in order to receive the warranty from the manufacturer. Submit pressure test to manufacturer as required.

## PART 2 - PRODUCTS

### 2.1 OWNER FURNISHED PRODUCTS

- A. Owner's Suppliers will furnish the following products as specified in Appendix A (Section 15100) and shown on the drawings for installation by Contractor.
  - 1. Water piping specialties as listed in Part 2 herein.
  - 2. Drainage piping specialties including floor and roof drains, cleanouts, and accessories.

### 2.2 PIPING SYSTEM SCHEDULE

- A. Provide the following piping systems unless noted as Owner furnished.

### 2.3 DOMESTIC WATER PIPING

- A. Water Piping Above Grade:
  - 1. Type "L" hard drawn, seamless copper water tube, ASTM B88.
  - 2. Jointing: Join with wrought copper pressure fittings, ANSI B16.22. Make joints using "lead free" solder and a noncorrosive, pastetype flux. Core solder is not permitted. Solder shall be solid string or wire type, ASTM B32 Alloy Sb-5, 95-5 Tin Antimony. Where
    - 3. soldered copper piping is connected to threaded brass piping, use cast brass adaptor.
    - 4. At Contractor's option, in lieu of a soldered copper piping system as specified above, any of the following copper pipe assembly systems may be used.
      - a. CTS Copper Grooved Piping System by [Victaulic Company of America](#): Copper tubing systems from 2 inch through 8 inch shall be installed using mechanical pipe couplings of a bolted type, with pressure-responsive gaskets and grooved end copper or bronze fittings. The CTS System shall include the following components:
        - 1) Copper Tube: Type "L" hard drawn, seamless copper water tube, ASTM B88.
        - 2) Mechanical Couplings: Style 606 rigid couplings 2 inch – 8 inch for copper consisting of a ductile iron cast housing, a synthetic rubber gasket of a pressure-responsive design, with plated nuts and bolts to secure unit together.
        - 3) Coupling Housings: Ductile iron conforming to ASTM A536, Grade 65-45-12, with a copper color alkyd enamel paint coating.
        - 4) Gaskets: Molded of Grade "E" EPDM synthetic rubber, conforming to ASTM D2000, designation 2CA615A25B24F17Z, and recommended for potable water service within the specified temperature range of -30 to +230 degrees F. Gaskets shall conform to the copper tube size (CTS) outside diameter and coupling housing inside diameter.
        - 5) Flange Adapters: Style 641 adapters 2 inch – 6 inch, ductile iron ASTM A536, Grade 65-45-12, engaging directly into roll grooved copper tube and fittings and bolting directly to ANSI Class 125 cast iron and Class 150 steel flanged components; installer shall provide standard flange bolts.

- 6) Fittings: Full flow copper fittings with grooves designed to accept Victaulic grooved end couplings. Fittings shall be copper per ASTM B75 alloy C12200; or bronze sand castings per ASTM B584 copper alloy CDA 844 (81-3-7-9) per ANSI B16.18. Use Style 47 dielectric waterways when connecting dissimilar metals in liquid systems.
  - 7) Valves: Series 608 Butterfly valves, 2-1/2 inch – 6 inch, 300 psi, with grooved ends, cast bronze body to CDA-836 (85-5-5-5), rubber encapsulated ductile iron disc, ASTM A536, Grade 65-45-12. Bubble tight, dead-end or bi-directional service as required.
- b. Press-connect copper pipe fitting system by one of the following:
    - 1) ProPress by [Viega](#).
    - 2) Xpress by [Elkhart Products Corporation](#).
    - 3) Presssystem by [NIBCO](#).
5. Mechanically formed tee fitting system by [T-Drill Industries](#) in accordance with ASTM F 2014.
  6. Stainless Steel pipe and fitting system by [AQUApipe Stainless](#).
    - a. Pipe: Comply with ASME B31.9 and NSF 61.
    - b. Fittings: Shall be 304 or 316 with interchangeable seals.
  7. Crosslinked PE (PEX) Tubing:
    - a. PEX Tube: Tube shall be tested and certified for potable water systems, and shall comply with ANSI/NSF Standard 14, ANSI/NSF Standard 61, and ASTM F876 and/or ASTM F877. Tube shall be labeled with the above certifications.
    - b. Provide PEX tubing system by one of the following:
      - 1) [NIBCO, Inc](#)
      - 2) [REHAU](#)
      - 3) [Uponor \(Formerly/Wirsbo\)](#)
      - 4) [Watts Water Technologies](#)
      - 5) [Zum Engineered Water Solutions](#)
    - c. Tube shall be white in color.
    - d. Fittings: Lead free brass or copper fittings, copper crimp connectors, stainless steel clamp connectors and cold expansion sleeves shall be tested and certified for potable water systems and shall comply with one of the following Standards: ASTM F1807, ASTM F1960, ASTM F2098.
    - e. PEX tube, brass or copper fittings and connectors shall be by the same manufacturer and assembled with the manufacturer's approved tools. The same connection method shall be used throughout the installation.
  8. Polypropylene (PP-RCT) Piping:
    - a. Polypropylene (PP-RRCT) piping containing faser (a fiber layer to contain thermal expansion).
    - b. Pipe shall be tested and certified for potable water systems, and shall comply with ANSI/NSF Standard 14, ANSI/NSF Standard 61, ASTM F2023, ASTM F2389 and ASTM D635. Pipe shall be labeled with the above certifications.
    - c. PP pipe, fittings and adapters shall be by one manufacturer. Use only manufacturer approved heat fusion tools.
    - d. Fittings: Connections and transition to other pipe material or types shall be made by manufacturer approved products and tools.
    - e. General duty metallic valves (i.e., gate, globe, check, and ball, valves) are scheduled on the drawing.
- B. Water Piping Below Grade (Under Slab):
1. 1-1/2 Inches and Smaller:
    - a. Crosslinked PE (PEX) tubing, ASTM F876 without joints beneath the slab.
    - b. Type "K" soft copper without joints beneath slab.
  2. 2 Inches and Larger: Type K hard drawn with brazed fittings.
- C. Chrome-Plated Seamless Brass Tube: ASTM B135.
- D. Insulation:
1. Manufacturers: Subject to compliance with requirements, provide insulation as manufactured by one of the following:
    - a. [CertainTeed](#).
    - b. [Imcoa \(Nomaco K-Flex\)](#).
    - c. [Knauf](#).

- d. [Owens-Corning](#).
  - e. [Johns Manville](#).
  - f. [Armacell](#).
2. Provide one of the following types of insulation throughout the project:
    - a. Rigid Glass Fiber: Type ASJ/SSL, maximum k factor at 75 degrees F of 0.23 Btu-in/hr.f.sq ft, 3 lb/cu.ft density. Vapor barrier jacket shall be white kraft paper with glass fiber yarn, bonded to aluminized film conforming to ASTM C921, with a maximum moisture vapor transmission rate of 0.02 perm-inch in accordance with ASTM E96. Insulate fittings with PVC covers with glass fiber inserts.
    - b. Polymer Foam Insulation: Arctitherm by Imcoa or equal. Maximum k factor at 75 degrees F of 0.25 Btu-in/hr.f.sq ft, 1.5 lbs/cu. Ft. density, maximum flame spread and smoke development of 25 and 50, respectively per ASTM E84. Insulate fittings with pre-formed foam covers.
    - c. Elastomeric Flexible Closed Cell Insulation: AP Armaflex W (white) by Armacell or equal. Maximum k factor at 75 degrees F of 0.28 Btu-in/hr.f.sq ft, maximum flame spread and smoke development of 25 and 50, respectively. Insulate fittings per manufacturer's recommendations.
  3. Insulation Color: White.
  4. Insulation Thickness: Provide minimum insulation thickness for water piping in compliance with IECC and ASHRAE 90.1 and the following:
    - a. Hot Water:
      - 1) Pipes 1-1/4 inch in diameter and less: 1 inch insulation.
      - 2) Pipes 1-1/2 inch in diameter and greater: 1-1/2 inch insulation.
    - b. Cold Water: ½ inch insulation.

#### 2.4 SANITARY WASTE AND VENT PIPING

- A. Soil, Waste, and Vent Piping: Provide any of the following as applicable:
  1. PVC Pipe: May be used for sanitary drainage pipes (drain, waste, and vent) where permitted by Authority Having Jurisdiction.
    - a. Solid-Wall PVC Pipe: ASTM D2665, drain, waste, and vent. Cellular (foam) core PVC not permitted.
    - b. PVC Socket Fittings, ASTM D2665, made to ASTM D3311, drain, waste, and vent patterns.
  2. Cast Iron: Cast iron soil pipe and fittings, coated inside and outside, ASTM A74 or ASTM A888. Provide weight of pipe as required by code for location and duty.
  3. Ductile-Iron Pipe: AWWA C151 or AWWA C115 ductile-iron pipe, with AWWA C104 cement-mortar lining.
  4. Copper Drainage Tubing (Above grade only): Copper drainage tubing conforming to ASTM B306.
  5. ABS Pipe: Not Permitted.
- B. Joints:
  1. Cast Iron Pipe: Push-on compression gasketed type joint for hub and spigot, ASTM C564. No-hub mechanical joints with center stops, ASTM C1277 or ASTM C1540.
  2. PVC Pipe: Solvent-welded joints.
  3. Copper Drainage Tubing: Join with wrought copper pressure fittings, ANSI B16.22. Make joints using "lead free" solder and a non-corrosive paste type flux. Core solder shall not be used. Solder shall be solid string or wire type.
- C. Traps:
  1. Provide deep seal P-traps for floor drains, including drains furnished as integral parts of floor-type mop basins, and similar fixtures.

#### 2.5 AIR CONDITIONING CONDENSATE PIPING

- A. Condensate Trap: Install trap furnished with RTU.

#### 2.6 WATER PIPING SPECIALITIES (OWNER FURNISHED, CONTRACTOR INSTALLED)

- A. Subject to compliance with Project requirements, install Owner furnished piping specialties of manufacturers, types, and model numbers as indicated on the Plumbing Schedules on the Drawings. Water piping specialties shall include

such items as hose bibbs, hydrants, valves, vacuum breakers, mixing valves, pressure reducing (regulating) valves, expansion tanks and accessories.

## 2.7 SPECIALTY PLUMBING FIXTURE

- A. Subject to compliance with Project requirements, provide plumbing fixture specialties of manufacturers, types, and model numbers as indicated on the SPECIALTY PLUMBING FIXTURE SCHEDULE on the Drawings. Plumbing fixture specialties shall include such items as backflow preventers, water hammer arresters, trap primers, and ball valves

## 2.8 DRAINAGE PIPING SPECIALITIES (OWNER FURNISHED, CONTRACTOR INSTALLED)

- A. Subject to compliance with Project requirements, install Owner furnished piping specialties of manufacturers, types, and model numbers as indicated on the Plumbing Schedules on the Drawings. Drainage piping specialties shall include floor and roof drains, and cleanouts and accessories.

## 2.9 PIPE FREEZE PROTECTION

- A. Pipe freeze protection system shall include the following:
  1. Parallel circuit heating cable.
  2. Transformers.
  3. Outdoor ambient thermostat.
  4. Junction boxes.
  5. Branch circuit wiring and conduit as specified in Section 16100.
  6. Other items as necessary to complete system.
- B. Components:
  1. Heating Cable: Parallel circuit, jacketed cable, self-limiting, 120 volt. Provide XL-Trace as manufactured by [nVent/Raychem](#) or CO Series by [Delta-Therm](#).
    - a. Provide minimum 5 watts per lineal foot (or more) as required for specified piping and insulation per manufacturer's published instructions.
    - b. Provide termination fittings for direct connection to junction boxes.
  2. Junction Boxes: NEMA 5 watertight.
  3. Outdoor Ambient Thermostat: Provide thermostat with adjustable contacts. Set contacts to close at 40 degrees F on decreasing temperature.

## 2.10 SUBSTITUTIONS

- A. Reference Section 01600.

## 2.11 THERMOMETERS, GENERAL

- A. Accuracy: Plus or minus 1 percent of range span or plus or minus one scale division to maximum of 1.5 percent of range span.
- B. Scale range: Temperature ranges for services listed as follows:
  1. Domestic Hot Water: 30 to 240 deg with 2-degree scale divisions (0 to 115 deg C with 1-degree scale divisions).
  2. Domestic Cold Water: 0 to 100 deg F with 2-degree scale divisions (minus 18 to 38 deg C with 1-degree scale divisions).
  3. Hot Water: 30 to 300 deg with 2-degree scale divisions (0 to 150 deg C with 1-degree scale divisions).
  4. Condenser Water: 0 to 160 deg F with 2-degree scale divisions (minus 18 to 70 deg C with 1-degree scale divisions).
  5. Chilled Water: 0 to 100 deg F with 2-degree scale divisions (minus 18 to 38 deg C with 1-degree scale divisions).

## 2.12 GLASS TUBE INDUSTRIAL THERMOMETERS

15100-7

- A. Case: Die cast, aluminum finished, in baked epoxy enamel, glass front, spring secured, 9 inches long.
- B. Adjustable Joint: Finished to match case, 180-degree adjustment in vertical plane, 360-degree adjustment in horizontal plane, with locking device.
- C. Tube: Non-red color reading, non-toxic organic spirit-filled glass tube, magnifying lens.
- D. Scale: Satin-faced, non-reflective aluminum, with permanently etched markings.
- E. Stem: Copper-plated steel, aluminum or brass, for separable socket, length to suit installation.

#### 2.13 THERMOMETER WELLS

- A. Thermometer Wells: Brass or stainless steel, pressure rated to match piping system design pressure; with 2-inch extension for insulated piping and threaded cap nut with chain permanently fastened to well and cap.
- B. Thermometer Wells: Install in piping tee where thermometers are indicated, in vertical position. Fill well with oil or graphite and secure cap.

#### 2.14 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Glass Tube Industrial Thermometers:
    - a. H. O. Terice Co., <http://www.terice.com/temperature.asp>
    - b. Marsh Bellofram Group, <http://www.marshbellofram.com/marsh/products/industrial-thermometer/>
    - c. <http://www.miljoco.com/thermometers/industrial-thermometers/>
    - d. Weiss Instruments, Inc. <http://www.weissinstruments.com/industrial-glass-thermometers.html>
    - e. Weksler Instruments Corp. <http://www.weksler.com/>
    - f. Winters Instruments <http://www.winters.com/>

### PART 3 - EXECUTION

#### 3.1 PIPING INSTALLATION

- A. Install piping and accessories at locations and of sizes shown on the drawings.
- B. Install proprietary piping systems, accessories, and products in accordance with manufacturer's published instructions.
- C. Connect piping and fittings in accordance with manufacturer's instructions using specialty tools as required and recommended by the manufacturer.
- D. Install piping neatly and parallel with, or perpendicular to, lines of the structure. Install pipe hangers as specified in Section 15050 to maintain accurately aligned piping systems, adequately supported both laterally and vertically.
- E. Backfill and compact trenches for piping below the slab per Section 02300. Install underground plastic gravity drain pipe according to ASTM D 2321.
- F. Provide Schedule 40 steel pipe sleeve, minimum of one size larger than the protected pipe, for underground piping routed beneath structural footings. Extend sleeve 24 inches in both directions beyond the footing.
- G. Where practical, connect two or more vents together and extend as one vent through roof. Make vent connections to stacks by appropriate use of 45 degree wyes, long sweep quarter bends, sixth, eighth, or sixteenth bends, except that sanitary tees may be used on the vertical stacks.
- H. Extend vent piping 12 inches above roof line or more if required by Authority Having Jurisdiction. Coordinate installation with roofing.

- I. Conceal piping in chases, interior walls, furred spaces, and above ceiling.
- J. Identify nonpotable water systems by color markings or metal tags in accordance with ASME A13.1.
- K. Make piping connections to fixtures and equipment with chrome-plated seamless brass tube with cleanout plug and escutcheon.
- L. For items to be installed on split face CMU, grind surface of CMU to a smooth finish for tight installation. Seal with silicone sealant in accordance with Section 07900.
- M. PEX Domestic Water Tubing:
  - 1. Install piping similar to copper piping as shown on drawings. Do not use manifold system.
  - 2. Protect tubing from UV radiation during pre-installation storage and after installation.
  - 3. Provide adequate tubing length for contraction and expansion of tubing.
  - 4. Tubing may be bundled. Do not bundle cold water lines with hot water or hot water return lines.
  - 5. Protect tubing routed through metal studs with grommets or sleeves at each stud.
  - 6. Do not install PEX tubing in masonry walls.
  - 7. Install type "L" copper pipe at the inlet and outlet of the water heater, minimum 18 inches long.
  - 8. Utilize water hammer arrestors as specified for the copper tube system.
  - 9. Tubing sizes shall be as shown on the Equivalent Pipe Size Schedule on the drawings.
  - 10. Coordinate PEX to plumbing fixture fittings with the furnished fixture accessories.
    - a. Use copper stub-outs and stub-out brackets secured to wall for fixtures furnished with compression stops.
    - b. Do not use PEX for flush valves.
  - 11. Provide recommended methods for controlling thermal expansion in hot water piping for straight runs every 50 feet.
- N. Polypropylene (PP-RCT)
  - 1. Install piping similar to copper piping as shown on drawings.
    - a. Install polypropylene (PP-RCT) piping containing faser (a fiber layer to contain thermal expansion) SDR 7.4 for hot water and hot water return piping. Do not install copper tube in polypropylene hot water and hot water return systems.
    - b. Install polypropylene (PP-RCT) piping SDR 11 for cold water piping.
  - 2. Store piping and fittings in factory-issued protective bag until immediately prior to installation to protect the pipe from dust, scratches and UV radiation damage.
  - 3. Utilize water hammer arrestors as specified for the copper pipe system.
  - 4. Pipe sizes shall be as shown on the Equivalent Pipe Size Schedule on the drawings.
  - 5. Coordinate piping to plumbing fixture fittings with the furnished fixture accessories.
    - a. Use copper stub-outs and stub-out brackets secured to wall for fixtures furnished with compression stops.
    - b. Use manufacturer's threaded fittings for connections to flush valves.
  - 6. Fusion Welding of Joints
    - a. Install fittings and joints using socket-fusion, electrofusion, or butt-fusion as applicable for the fitting type.
    - b. Fusion-weld tooling, welding machines, and electrofusion devices shall be as specified by the pipe and fittings manufacturer.
    - c. Prior to joining, the pipe and fittings shall be prepared in accordance with F 2389 and the manufacturer's specifications.
    - d. Joint preparation, setting and alignment, fusion process, cooling times and working pressure shall be in accordance with the pipe and fitting manufacturer's specifications
  - 7. Provide recommended methods for controlling thermal expansion in hot water piping for straight runs every 120 feet.

### 3.2 PIPING INSULATION - INSTALLATION

- A. Domestic Hot and Cold Water Lines: Insulate lines above slab.



### 3.3 WATER PIPING SPECIALITIES INSTALLATION

- A. Install backflow preventers in each water supply to mechanical equipment and systems and to other equipment where shown and water systems that may be sources of contamination. Comply with Authorities Having Jurisdiction.
  - 1. Locate backflow preventers in same room as connected equipment or system.
  - 2. Install drain for backflow preventers with atmospheric-vent drain connection with air-gap fitting, fixed air-gap fitting, or equivalent positive pipe separation of at least two pipe diameters in drain piping and pipe to floor drain. Locate air-gap device attached to or under backflow preventer. Simple air breaks are not acceptable for this application.
  - 3. Do not install bypass piping around backflow preventers.
- B. Install water regulators with inlet and outlet shutoff valves. Install pressure gages on inlet and outlet.
- C. Install balancing valves in locations where they can easily be adjusted.
- D. Install temperature-actuated water mixing valves with check stops or shutoff valves on inlets and with shutoff valve on outlet.
  - 1. Install thermometers and water regulators if specified.
  - 2. Install cabinet-type units recessed in or surface mounted on wall as specified.
- E. Install Y-pattern strainers for water on supply side of each control valves and pressure-reducing valves.
- F. Install water hammer arresters in water piping according to PDI-WH 201.
- G. Install supply-type, trap-seal primer valves with outlet piping pitched down toward drain trap a minimum of 1 percent, and connect to floor-drain body, trap, or inlet fitting. Adjust valve for proper flow.
- H. Drawings indicate general arrangement of piping and specialties.

### 3.4 LABELING AND IDENTIFYING

- A. Equipment Nameplates (for new equipment): Manufacturer's standard 3/32 inch thick black plastic laminate nameplates with 5/32 inch holes for fasteners. Provide nameplates and signs no smaller than 1-1/2 inches square.
  - 1. Provide engraved white lettering indicating piping system abbreviation in characters 1/4 inch high and sequenced valve numbers in characters 1/2 inch high.
- B. Signs: In addition to identifying unit, provide signs which distinguish among multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operation.
- C. Install equipment nameplate or sign on or near each of the following new items:
  - 1. Intermediate atmospheric-vent backflow preventers.
  - 2. Reduced-pressure-principle backflow preventers.
  - 3. Double-check backflow-prevention assemblies.
  - 4. Water pressure-reducing valves.
  - 5. Primary, thermostatic, water mixing valves.
  - 6. Supply-type, trap-seal primer valves.

### 3.5 DRAIN PIPING SPECIALTIES INSTALLATION

- A. Install backwater valves in building drain piping. For interior installation, provide cleanout deck plate flush with floor and centered over backwater valve cover, and of adequate size to remove valve cover for servicing.
- B. For floor cleanouts for piping below floors, install cleanout deck plates with top flush with finished floor.
- C. For cleanouts located in concealed piping, install cleanout wall access covers, of types indicated, with frame and cover flush with finished wall.

- D. Install floor drains at low points of surface areas to be drained. Set grates of drains flush with finished floor, unless otherwise indicated.
  - 1. Position floor drains for easy access and maintenance.
  - 2. Install floor-drain flashing collar or flange so no leakage occurs between drain and adjoining flooring. Maintain integrity of waterproof membranes where penetrated.
  - 3. Install individual traps for floor drains connected to sanitary building drain, unless otherwise indicated.
- E. Install deep-seal traps on floor drains and other waste outlets, if indicated.
- F. Install floor-drain, trap-seal primer fittings on inlet to floor drains that require trap-seal primer connection.
  - 1. Exception: Fitting may be omitted if trap has trap-seal primer connection.
  - 2. Size: Same as floor drain inlet.
- G. Install air-gap fittings on draining-type backflow preventers and on indirect-waste piping discharge into sanitary drainage system.
- H. Install traps on plumbing specialty drain outlets. Omit traps on indirect wastes unless trap is indicated.
- I. Install escutcheons at wall, floor, and ceiling penetrations in exposed finished locations and within cabinets and millwork. Use deep-pattern escutcheons if required to conceal protruding pipe fittings.

### 3.6 PIPE FREEZE PROTECTION

- A. Install heating cable at locations shown on drawings for pipe freeze protection.
- B. Cut heating cable to length required for pipe lengths and watt per foot requirements. Secure to pipe and install in accordance with manufacturer's published instructions.

### 3.7 CLEANING AND DISINFECTION

- A. Clean and disinfect potable domestic water piping as follows:
  - 1. Purge new piping and parts of existing piping that have been altered, extended, or repaired before using.
  - 2. Use purging and disinfecting procedures prescribed by Authorities Having Jurisdiction. If methods are not prescribed, use procedures described in AWWA C651 or follow procedures described as follows:
    - a. Flush piping system with clean, potable water until dirty water does not appear at outlets.
    - b. Fill and isolate system according to either of the following:
      - 1) Fill system or part thereof with water/chlorine solution with at least 50 ppm of chlorine. Isolate with valves and allow to stand for 24 hours.
      - 2) Fill system or part thereof with water/chlorine solution with at least 200 ppm of chlorine. Isolate and allow to stand for three hours.
    - c. After the standing time, flush system with clean, potable water until the chlorine is purged from the system.
- B. Submit water samples in sterile bottles to Authorities Having Jurisdiction. Repeat procedures if biological examination shows contamination.
- C. Reports: Prepare disinfection reports signed by the Authority Having Jurisdiction and submit to Architect with Closeout Submittals.

### 3.8 FIELD QUALITY CONTROL

- A. Pipe Tests:
  - 1. Test plumbing drainage systems under 10 foot static head for a period of not less than 24 hours.
  - 2. Test water systems under 150 psig hydrostatic pressure.
  - 3. Test underground piping prior to backfilling and before installing equipment and before insulation is applied, using specified methods and conditions. Subject piping to test for not less than 24 hours. Make necessary replacements or repairs and repeat tests until entire system, including equipment, is accepted as satisfactory.

4. Pressure test PEX piping systems in accordance with the manufacturer's requirements. Do not exceed 150 psig.
5. Pressure test Polypropylene piping in accordance with manufacturer's Installation Manual. Submit pressure test to polypropylene manufacturer.
6. Install equipment, operate systems, clean out scale, dirt, oil, waste, and foreign matter, and correct additional leaks.
7. Test each reduced-pressure-principle backflow preventer and double-check backflow-prevention assembly according to Authorities Having Jurisdiction and the device's reference standard.
8. Pipe tests specified in this Section shall be to five feet outside building lines or to point of connection to exterior lines. Drains to oil/grease interceptor (separator) shall be tested to the point of the oil/grease interceptor outlet.

B. Underground Piping Video Inspection:

1. General: Perform video inspection of underground sewer piping from the point of connection to the manhole outside the building through the mains and through the single takeoff to each fixture.
2. When there are problems with existing sewer piping, perform video inspection of existing sewer piping and coordinate repair of deficiencies with Owner's Construction Manager. An equitable adjustment will be made in the contract price for additional work directed and performed.
3. Video Inspection Contractor Qualifications: Specified in Part 1.
4. Video Inspection Certification: Provide video inspection certification as specified in Part 1.
5. Video Taping Requirements:
  - a. Video camera designed for express purpose of sewer line inspection.
  - b. Camera and apparatus capable of extending to all points of piping required within 2 inch to 8 inch diameter pipe.
6. Procedure:
  - a. For new floor slab, inspect sewer pipes with video camera no earlier than 30 days after new floor slab has been poured. Sections of sewer determined to be deficient shall be uncovered and repaired or replaced to satisfaction of Owner. Retest repaired section.
  - b. When a new floor slab is not required, refer to drawings for video camera scope requirement.
  - c. Adequately flush and clean sewer piping prior to video inspection
  - d. Provide additional video inspection at contractor's expense if there are clogging problems within the first year warranty and if requested by owner.
7. Video Inspection Report:
  - a. Submit in accordance with requirements in Part 1.
  - b. Submit bound report in MS Word format.
  - c. Provide summary report of pipes inspected and defects noted
  - d. Log shall show the exact measure location of faults such as, but not limited to:
    - 1) Open joints.
    - 2) Broken, cracked or collapsed pipe.
    - 3) Accumulation of debris or obstructions.
    - 4) Evidence of infiltration.
    - 5) Water depth variation and sags.
    - 6) Protrusions.
  - e. The reference location shall include the distance away from the reference point of entry such as manhole or cleanout and the position of the fault as to the bottom, top or side of the pipe.
  - f. Provide plan of piping network covered with notations.

3.9 ADJUSTING

- A. Set field-adjustable pressure set points of water pressure-reducing valves.
- B. Set field-adjustable flow of balancing valves.
- C. Set field-adjustable temperature set points of temperature-actuated water mixing valves.

3.10 PROTECTION

- A. Protect drains during remainder of construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.
- B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

END OF SECTION

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## SECTION 15190 - FUEL GAS PIPING

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Propane gas piping.
  - 2. Gas valves and regulators.
- B. Related Sections:
  - 1. Section 09900 - Paints and Coatings.
  - 2. Section 15050 - Basic Mechanical Materials And Methods.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. American National Standards Institute (ANSI):
  - 1. ANSI B31.9 - Building Services Piping Code.
  - 2. ANSI Z21.80/CSA 6.22 – Line Pressure Regulators.
- C. American Society of Mechanical Engineers (ASME):
  - 1. ASME B16.3 - Malleable Iron Threaded Fittings.
- D. American Standards for Testing and Materials (ASTM):
  - 1. ASTM A53 - Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
  - 2. ASTM A234 - Specification for Pipe Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures.
- E. National Fire Protection Association (NFPA):
  - 1. NFPA 54 - National Fuel Gas Code.

## 1.3 QUALITY ASSURANCE

- A. Certifications:
  - 1. Product Certificates: Provide Manufacturer's Certification for gas regulators if required by Authority Having Jurisdictions.
  - 2. Welding: Pipe welders shall be certified and bear evidence of certification 30 days prior to commencing work on this project. When directed, welders shall be retested at Contractor's expense when evidence indicates a lack of welder proficiency. Certification will be by Pittsburgh Testing Laboratories or other approved authority.

## PART 2 - PRODUCTS

## 2.1 FUEL GAS PIPING (ABOVE GRADE)

- A. Piping: Black steel, standard weight, Schedule 40 ASTM A53.
  - 1. Piping 2 inches and smaller: Welded or threaded with malleable iron fittings including couplings.
  - 2. Piping 2-1/2 inches and larger: Welded, with butt-welded fittings.
- B. Fittings: ASME B16.3, malleable iron or ASTM A234, forged steel welded type.
- C. Joints: NFPA 54, threaded or welded to ANSI B31.9, ASME Section 1.

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## 2.2 GAS SHUT-OFF VALVES

- A. Quarter-turn Ball Valve: UL listed for natural gas service or LP gas service as required; threaded ends, with bronze body, chrome plated brass ball, "Teflon" or "TFE" seats and seals, blowout-proof stem, adjustable packing gland, and vinyl-covered steel handle. Provide valves by one of the following:
  - 1. Conbraco (Apollo): 80-100 series (1/4"-3").
  - 2. Nibco: T-585-70-UL series (1/2"-1"), T-580-70-UL series (1-1/4"-3").
  - 3. Watts: B6000-UL series (1/4"-4").

## 2.3 PRESSURE REGULATORS

- A. Gas Pressure Reducing Regulators: ANSI Z21.80/CSA 6.22, provide commercial style regulators by one of the manufacturers as scheduled on the drawings.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install interior piping neatly and parallel with, or perpendicular to, lines of the structure. Install pipe hangers as specified in Section 15050 to maintain accurately aligned piping systems, adequately supported both laterally and vertically.
- B. Extend rigid gas piping to exterior gas appliances and install shut-off valve, dirt leg, and union at each appliance.
- C. Provide flexible gas hose connections to all indoor heating equipment, maximum length of 24".
- D. Conform to NFPA 54 and applicable local codes.
- E. Roof Protection: Protect roofing with welding blankets.
- F. Prime interior gas piping before installation. Complete installation of gas piping before roof deck is painted. Conform to Section 09900 for painting and for touch-up on the job site.
- G. Prime and paint exterior gas piping before installation. Conform to Section 09900 for painting and for touch-up on the job site.
- H. Identify interior gas piping with color markings on top of pipe in accordance with ASME A13.1.

### 3.2 FIELD QUALITY CONTROL

- A. Testing:
  - 1. Pressure test piping at 60 psig, or as required by Authority Having Jurisdiction if more stringent.
  - 2. Maintain full test pressure for a period of 30 minutes, and make visual inspection for tightness of system.

END OF SECTION

## SECTION 15410 (22 4000) - PLUMBING FIXTURES

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Owner furnished plumbing fixtures and plumbing fixture trim for installation by Contractor.
  - 2. Owner furnished Pharmacy Water Filtration System for installation by Contractor.
- B. Related Requirements: The following list is intended to aid in locating products and work related to or dependent on the scope of this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
  - 1. Section 01770 – Contract Closeout: Operation and maintenance data requirements.
  - 2. Section 07900 - Joint Sealers: Sealant for fixtures at wall and floors.
  - 3. Appendix A – Products and Work by Owner or Separate Contractor: Manufacturers, suppliers, product descriptions, installation (if applicable), and general procedures related to Owner furnished products.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. NSF International (NSF):
  - 1. NSF 61 Annex G - Weighted Average Lead Content Evaluation Procedure to a 0.24 Percent Lead Requirement.

## 1.3 QUALITY ASSURANCE

- A. Regulatory Requirements:
  - 1. Products Requiring Electrical Connection: Listed and classified by Underwriter's Laboratories, Incorporated, and acceptable to the authority having jurisdiction as suitable for the purpose specified and indicated.
  - 2. Disabled Access: Conform to applicable local, State or Federal disabled access requirements for the installation, mounting heights, and operation of plumbing fixture.
  - 3. Lead-Free Compliance: Fixtures and fixture trim shall comply with the requirements of NSF 61 Annex G for lavatories, sinks and water coolers.

## 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Transport, handle, store, and protect products in compliance with the requirements of Section 01600.
- B. Owner's Supplier will deliver fixtures to site in factory packaging.
- C. Receive Owner Furnished products in accordance with the requirements of Section 01600.
  - 1. Product Delivery: Owner's Supplier will deliver Owner furnished products to site to be received by Contractor. Contact Owner's Suppliers to coordinate delivery of Owner furnished products and materials.
  - 2. Schedule delivery of items to installation areas that are in proper condition to receive them.
- D. Inspect materials delivered and reject those not qualifying with requirements, those damaged in transit, or those that appear otherwise unsatisfactory.
- E. Place items neatly and systematically to avoid damage, store in clean, dry, enclosed, and secure storage area.



- F. Protect installed fixtures from damage by securing areas and by factory packaging in place to protect fixtures and prevent use.

## PART 2 - PRODUCTS

### 2.1 OWNER FURNISHED PRODUCTS

- A. Owner's Supplier will furnish plumbing fixtures and fixture trim as specified in Appendix A (Section 15410) and shown on the drawings for installation by Contractor.
- B. Owner's Supplier will furnish Pharmacy Water Filtration System as specified in Appendix A (Section 15410) and shown on the drawings for installation by Contractor.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Toilet and Urinal Inspection: At time of fixture removal in preparation for new floor and wall finishes, examine the following:
  - 1. Floor or wall mount integrity.
    - a. Verify floor or wall mount is sufficient for secure reinstallation. Note any needs for anchor bolt replacement, blocking repair, or requirement for concrete embedment reinforcement.
    - b. Verify wall mount fixtures are secure in the vertical axis.
  - 2. Proper flush valve and sensor operation. Note needs for replacement if not otherwise noted on drawings.
  - 3. Finish and condition of porcelain surface on toilet and urinal fixtures.
    - a. Identify nicks, cracks, scratches, and chips in the porcelain finish. Repair or replace fixtures as specified herein.
- B. Prior to reinstallation, examine surfaces and adjacent areas where products will be installed. Verify that conditions conform to product manufacturer's requirements and installation conditions. Do not proceed until unsatisfactory conditions have been corrected.
  - 1. Verify that walls and floor finishes are prepared and ready for installation of fixtures.
  - 2. Verify that plumbing piping for fixture is in the correct location and of the correct type.

### 3.2 WATER CLOSET FIXTURE REPAIRS

- A. Prior to storage of existing to remain water closet fixtures, provide commercial cleaning to remove mineral deposits and lime scale, hard water staining, and rust as specified in Section 01740.
- B. Repair water closet fixtures and mounting embedments after fixture removal and prior to storage.
  - 1. Toilet and Urinal Fixture Mounts: Patch or replace concrete around failed anchor embedments as required for secure reinstallation.
  - 2. Surface Damage in Porcelain Finish: Repair nicks, cracks, scratches, and chips in and around bowl, on rim, and on other horizontal and vertical porcelain surfaces.
    - a. Prepare area of surface damage by sanding lightly with fine grit emery cloth.
    - b. Clean and remove dust and residue from sanding.
    - c. Apply an epoxy repair putty compound recommended by the epoxy manufacturer as suitable for the type of fixture. Blend well.
    - d. Sand and smooth after recommended cure time. Apply a touch-up product to match porcelain color as recommended by the epoxy manufacturer.
  - 3. Do not use quick-set glues for porcelain surface repairs.
- C. Replace water closet fixtures exhibiting structural damage or cracks through full porcelain depth. Replace fixtures exhibiting deep etched staining that cannot be removed by the cleaning methods described in Section 01740.

### 3.3 PREPARATION

- A. Rough-in fixture piping connections in accordance with minimum sizes indicated on Drawings for particular fixtures.

### 3.4 INSTALLATION

- A. Install fixtures and trim in accordance with manufacturer's published instructions. Make final connections.
- B. Support each fixture in rigid manner which permits no perceptible movement of fixture by manually applied forces. Seal space between fixtures and floor or walls with silicone sealant.
- C. Install trap on fixture outlet except for fixtures having integral trap. Install each fixture with trap which is easily removable for servicing and cleaning.
- D. Install components level and plumb. Install toilet seats on water closets.
- E. Install and secure fixtures in place with carriers and bolts.
- F. Solidly attach water closets to floor or wall as required.
- G. Seal fixtures to wall and floor surfaces with sealant as specified in Section 07900, color to match fixture.
- H. Install escutcheons at each wall, floor, and ceiling penetration in exposed finished locations and within cabinets and millwork. Use deep pattern escutcheons where required to conceal protruding pipe fittings.
- I. Install insulation kits on ADA compliant sink and lavatory waste, continuous wastes, hot and cold water supplies where indicated on the drawings and as required by the ADA

### 3.5 FIELD QUALITY CONTROL

- A. Inspect plumbing fixture and trim installation, attachment to building, operation, and connections. Ensure that fixtures are installed and operate in conformance with disabled access requirements.
  - 1. Prior to final acceptance, inspect faucets, flush valves, stop valves, and similar devices, to determine that they operate properly and discharge proper quantities of water. Correct any deficiencies as directed by Owner's representative.

### 3.6 ADJUSTING AND CLEANING

- A. Operate and adjust stops or valves for intended water flow rate to fixtures without splashing, noise, or overflow.
  - 1. Replace malfunctioning units.
  - 2. Replace washers and seals of leaking and dripping faucets and stops.
- B. Clean fixtures, trim, and accessories of foreign materials, including labels affixed to new fixtures, before final acceptance.

END OF SECTION

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## SECTION 15600 - REFRIGERATION SYSTEMS

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Owner's Refrigeration equipment supplier will furnish refrigeration equipment as indicated on Drawings and defined in Appendix A – Products and Work by Owner or Separate Contractor.
1. Obtain services of an Owner approved Refrigeration Contractor to perform all work in this Section, unless noted otherwise.
- B. Section Includes:
1. Work and responsibilities associated with owner furnished refrigeration equipment for installation by the Contractor. Description of work and responsibilities includes, but is not limited to, installation, start-up, and commissioning of refrigeration systems and display cases, evaporator coils, condensers or condenser/compressor units, and interconnecting piping, condensate drains, and field installed refrigeration controls.
  2. Work and responsibilities for refrigeration equipment related items provided by the Contractor, including minor items necessary to the installation which may not specifically be mentioned in the Contract Documents. Such items include, but are not limited to, screws, shims, anchors, escutcheons, brackets, pipe sleeves, sealants, flux, glue, and changes due to unforeseen obstructions.
- C. Related Requirements: The following list is intended to aid in locating products and work related to or dependent on the scope in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
1. Section 07721 – Manufactured Curbs: Curbs for roof-mounted refrigeration equipment.
  2. Section 07900 – Joint Sealers: Products for use in sealing pipe penetrations.
  3. Section 13810 – Building Automation System.
  4. Section 15050 – Basic Mechanical Materials and Methods: Hangers and supports for refrigeration system piping.
  5. Section 16050 – Basic Electrical Materials and Methods.
  6. Section 16100 – Wiring Methods.
  7. Appendix A – Products and Work by Owner or Separate Contractor: Manufacturers, suppliers, and vendor contacts and product names and numbers related to Owner furnished products.
  8. Appendix B – Testing, Inspection, and Observation by Owner.
  9. Responsibility Matrix – Contractor responsibility as shown on the Drawings for coordinating removal and reinstallation of refrigerated case kick plate during floor work.

## 1.2 DEFINITION OF TERMS

- A. Work shall mean complete installation of equipment and devices in accordance with applicable Specifications and as described in the Drawings, Application Sheets, Manufacturer's Legend Sheets and Instructions.
- B. Refrigeration Contractor shall mean the Awarded Contractor's, Owner approved, Subcontractor that is responsible for performing the refrigeration work as specified on the construction documents. Refrigeration Contractor shall be responsible for compliance with applicable codes, ordinances, and work permits.
- C. Refrigeration Equipment: Equipment shown or noted on the Drawings to include the following:
1. Hot cases.
  2. Cold cases.
  3. Self-Contained refrigerated systems.
  4. Freezer/Cooler Panels and Doors.
  5. Evaporators.
  6. Mini-Racks.
  7. Rack-in Box (RIB).

8. Separate Condensers.
9. Secondary Glycol Skid.
10. Secondary Liquid Overfeed CO<sub>2</sub> (LOF) Skid.
11. Trans-Critical CO<sub>2</sub> Pack.
12. Owner furnished and installed Diamond Plate Refrigerated Case Protection (specified in Section 10260).
13. Other related equipment not specifically listed.

### 1.3 LAWS AND ORDINANCES

- A. Comply with laws, ordinances, rules, and regulations bearing on the Work. If Contractor observes that Drawings or Specifications, or both, are at variance therewith, Contractor shall promptly notify the Owner in writing. If Contractor, without written notice to the Owner, performs Work which is not in conformance with such laws, ordinances, rules and regulations, the Contractor shall bear all costs arising from correction thereof.
- B. Compliance with laws, rules, and regulations shall not be used as means of justifying installation or application of parts, assemblies, or methods inferior to those specified.
- C. Comply with OSHA Hazard Communication Standard 29 CFR 1910.1200 and 29 CFR 1926.59. A copy of Hazard Communication Program and all appropriate SDSs shall be on the job at all times.
- D. Obtain required permits and licenses for installation of refrigeration systems, piping, and equipment as stated in awarded contract prior to start of project.

### 1.4 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. ASTM International (ASTM):
  1. ASTM A 536 – Ductile Iron Castings.
  2. ASTM B 75 – Seamless Copper Tube.
  3. ASTM B 280 – Seamless Copper Tube for Air Conditioning and Refrigeration Field Service.
  4. ASTM B 584 – Copper Alloy Sand Castings for General Applications.
  5. ASTM B 813 – Liquid and Paste Fluxes for Soldering of Copper and Copper Alloy Tube.
  6. ASTM C 1710 – Installation of Flexible Closed Cell Preformed Insulation in Tube and Sheet Form.
  7. ASTM D 2665 – Polyvinyl Chloride (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings.
  8. ASTM D 2564 – Solvent Cements for Polyvinyl Chloride (PVC) Plastic Pipe and Fittings.
  9. ASTM E 84 – Surface Burning Characteristics of Building Materials.
- C. American National Standards (ANSI):
  1. ANSI B 16.22 – Wrought Copper Alloy Solder Joint Pressure Fittings.
- D. American National Standards Institute/American Society of Heating, Refrigerating and Air-Conditioning Engineers (ANSI/ASHRAE):
  1. ANSI/ASHRAE Standard 15 – Safety Standard for Refrigeration Systems.
- E. American National Standards Institute/American Society of Mechanical Engineers (ANSI/ASME):
  1. ANSI/ASME B1.20.1 - Pipe Threads, General Purpose (Inch).
  2. ANSI/ASME B31.9 – Building Services Piping.
- F. American Society of Mechanical Engineers (ASME):
  1. ASME A13.1 - Scheme for the Identification of Piping Systems.
  2. ASME B 1.1 - Unified Inch Screw Threads (UN and UNR Thread Form).
  3. ASME B 31.5 - Refrigeration Piping Standard.

### 1.5 DRAWINGS AND SPECIFICATIONS

- A. Comply with the requirements of Section 01770. The Drawings and Specifications are complementary; what is required by one shall be as binding as if required by both. Should the Drawings and Specifications be contradictory or should there be any apparent errors, discrepancies, or omissions, or should there be any doubt as to the meaning of either, the Contractor shall refer the matter to the RFI Process or Bid question.
- B. Neither the Contractor nor the Owner shall be responsible or rely on any verbal instructions.
- C. Addenda, corrections, or letters issued during time of bidding shall take precedence over Drawings and Specifications.

#### 1.6 EXAMINATION OF THE PREMISES

- A. The Contractor's bid shall take into consideration all conditions that may affect the Work under their Contract.
- B. Take field measurements and verify field conditions; compare such field measurements and conditions and other information known to the Contractor with the Drawings and Specifications before commencing activities. Errors, inconsistencies, or omissions discovered shall be reported to the RFI Process or Bid question.

#### 1.7 SUPERVISION AND CONSTRUCTION PROCEDURES

- A. Contractor shall provide complete construction schedule to the Mechanical Construction Manager (MCM) prior to the pre-construction meeting. Contractor shall ensure schedule is acceptable to all project stakeholders prior to submittal to the MCM.
- B. Contractor shall agree to undertake all Work contained within the Contract and complete the Work according to the approved construction schedule.
- C. Set equipment received in any given week in its final location by Friday of that week. This includes compressors, cases, condensers, etc. Complete the following items prior to scheduled substantial completion date:
  1. Refrigeration cases cleaned
  2. Walk-in coolers and freezers thoroughly cleaned
  3. Refrigeration tools and materials shall be stored in a safe location that does not disrupt store operations
- D. Furnish necessary supervision to coordinate activities of all trades to insure complete installation. The Contractor shall immediately report problems or anticipated problems that may impede progress of the Project to the Mechanical Construction Manager.
- E. Check new equipment against construction documents and report discrepancies to the Mechanical Construction Manager.
- F. Awarded contractor shall provide the MCM with a Punch list in Owner's online construction management system *Wrike* upon MCM arrival to the project.
- G. Awarded contractor shall provide a warranty plan to MCM at pre-construction meeting. (All applicable trades based on project scope of work).

#### 1.8 CLOSEOUT SUBMITTALS

- A. Comply with the requirements of Section 01770.
- B. Refrigeration Installation Handover Document / Sign Off Sheet: Submit completed Refrigeration Installation Handover Document / Sign Off Sheet via the Electronic Closeout Documents process and upload a separate copy to the Closeout Documents folder in Owner's construction management system *Wrike*.
- C. Record Documents: Provide laminated half-size refrigeration and Building Automation System as-built drawings. Install on interior side of compressor room door or on interior side of door panel.

- D. Operation and Maintenance Data: Collect operation and maintenance manuals furnished by the case and rack OEMs and store them together at the refrigeration rack.
  - 1. Product Data, including rated capacities of selected models, weights (shipping, installed, and operating), furnished specialties and accessories, and installation instructions.

#### 1.9 DELIVERY, STORAGE AND HANDLING

- A. Transport, handle and store products in accordance with the requirements of Section 01600.
- B. Receive Owner furnished products in accordance with the requirements of Appendix A (Section 15600).
- C. Owner Furnished Equipment which is damaged, defective or unsuitable for intended service shall be received by the Contractor and damage noted on the Bill of Lading and signed by the Contractor and Carrier agent. Immediately report Owner Furnished Equipment damage to Owner's Mechanical Construction Manager and include photos of damage and signed Bill of Lading. Issues may be reported to the Buyout Customer Service Team thru the Owner Supplied Items folder in *Wrike*.
- D. Contractor shall furnish a suitable means of securing and protecting all tools, materials, and equipment associated with refrigeration installation during construction period.
- E. Store refrigeration pipe and fittings in a clean and dry location. Receive fittings and store in closed containers or cartons, and store copper piping with rubber end plugs in place. Do not install copper tubing left uncapped for more than one day as refrigeration piping.
- F. Deliver brazing materials, flux, solvents, glues, sealants, insulation materials, lubricants, oils, and refrigerants required to complete refrigeration installation and store on job site in manufacturer's original packaging or crating with labeling intact and fully legible.
- G. Ship insulation materials and accessories such as adhesive and coatings to job site in marked, unopened containers as received from manufacturer. Store materials at job site in a proper manner, which does not damage, deface, or otherwise reduce their serviceability. Store highly flammable solvents, adhesives, and coatings in compliance with OSHA requirements. Store materials, which are susceptible to weather damage in a weatherproof environment and store materials with manufacturer's identification attached.
- H. SDSs for materials, compounds, and chemicals shall be maintained by the Contractor.
- I. Coordinate with Warehouse/Store and Owner's Mechanical Construction Manager for delivery schedules and times to adequately perform equipment installations and keep project baseline schedule.
- J. Coordinate with warehouse through a color coded label on equipment, which will have date, time of needed delivery to project site.
- K. Coordinate with Owner using an equipment location print that will be color coded schedule to match the warehouse color coded schedule of delivery dates, times.

#### 1.10 SEQUENCING, SCHEDULING, AND COORDINATION

- A. Sequence, schedule, and coordinate refrigeration installation and start-up activities with Owner's Mechanical Construction Manager to allow the overall project to be constructed in an orderly manner. Maintain current schedule in Owner's online construction management system.
- B. Provide personnel as necessary to match schedule needs.
- C. Send a representative to project meetings as required by the General Contractor.
- D. Purchase materials and arrange deliveries in a timely manner to avoid delay of the project. This may include taking early deliveries and off-site storage of items which might be in short supply.

- E. Provide on-site storage container as required. Coordinate with General Contractor for location and availability of on-site storage space. Walk-in cooler and freezer boxes are not to be used for storage.
- F. Notify, coordinate, and correspond with legal authorities having jurisdiction for required inspections of the refrigeration system and piping during the installation process.
- G. Coordinate with Building Automation System Contractor for completion of check-out activities.
- H. Coordinate and confirm system start-up dates with Owner's Mechanical Construction Manager.
- I. Use Owner's Contract Administration system for contracts, pay applications, potential change orders, change orders, contract documents, and requests for information, permitting and contract.
- J. Coordinate with the General Contractor and other sub-contractors the placement of refrigeration, electrical, mechanical, plumbing, and fire sprinkler systems to fit in the available clear space.
- K. Start-Up of the refrigeration systems shall consist of the following:
  1. Inspect delivered equipment upon arrival for inconsistencies with refrigeration design documents and damage. Coordinate with refrigeration equipment supplier to correct deficiencies.
  2. Verify that systems have been properly installed and are ready for start-up prior to soft start date.
  3. Assure systems are operational prior to onsite visit by manufacturer representative. Charge systems in accordance with specifications and begin start-up process. Schedule start-up so that systems are operational before equipment manufacturer representative site visit for Commissioning phase. Formally document start-up completion on Handover Documents and submit to Owner's Mechanical Construction Manager, within seven days after commissioning completion.
  4. System performance is reviewed by equipment manufacturer representative with assistance from the Contractor.
  5. Owner will not consider start-up complete until all Handover Documents are accepted complete by Owner's Mechanical Construction Manager.
  6. Supply technicians, tools, testing instruments, and materials necessary to adjust refrigeration equipment as directed by refrigeration equipment representative.

#### 1.11 CONTRACTOR RESPONSIBILITIES

- A. Obtain required permits and licenses for installation of refrigeration systems, piping, and equipment prior to start of project.
- B. Assign a competent Project Foreman with a minimum of five years' experience installing supermarket refrigeration systems. Foreman shall supervise daily activities associated with installation work including coordinating the activities of each trade as it relates to the refrigeration system installation in order to complete the work on the expected dates; serve as field contact representative and review installation documents for discrepancies. Foreman shall not be changed during the project without permission from the Owner's Mechanical Construction Manager but may be changed by the Owner's Mechanical Construction Manager with just cause (competency, failure to communicate, or failure to execute direction from the Owner's Mechanical Construction Manager).
- C. Verify installing refrigeration contractor or equipment start-up personnel is certified for work on Sporlan S3C case/coil controllers and have access to the Sporlan Tech Check mobile application.
  1. Sporlan Certification: Verify installing refrigeration contractor has acquired Sporlan certification by successfully completing Sporlan's online S3C training course and downloading the Certification.
  2. Sporlan Digital Application: After acquiring Certification, verify that installing contractor has downloaded the Sporlan Tech Check application from the App Store in order to begin using the app.
- D. Verify installing refrigeration contractor or equipment start-up personnel is certified for work on KE2 case/coil controllers.
  1. Novar Certification: Verify installing refrigeration contractor has acquired certification from Novar / Honeywell for case and coil controller installation.



- E. Project Foreman shall attend an OEM system installation training class for all system types being utilized on the project (HFC, Secondary Glycol, Transcritical CO2, and Secondary Overfeed CO2).
- F. Use Owner's Contract Administration system for contracts, pay applications, potential change orders, change orders, contract documents, and requests for information.
- G. Use Owner's online construction management system *Wrike* for scheduling, construction related project communications, and closeout document uploads, except Contract Closeout documents required in section 01770 – Contract Closeout.
- H. Installation of refrigeration systems involves multiple trades, skill sets, and activities including the following:
  1. Receiving, unloading, and setting grocery cases in their proper locations straight and level. This may include both refrigerated and non-refrigerated cases along with case wedges and cap displays supplied by case manufacturers. Align glass doors plumb and level to prevent saw-toothing of doors.
  2. Securing, bolting, buckling, sealing, and trimming out cases free of blemishes.
  3. Installing case condensate drains independently routed, concealed under cases, properly sloped, supported and trapped, in direction of flow to their designated hub drains or floor sinks.
  4. Setting air-cooled or evaporative condensers in their proper locations, level and anchoring them to building structure per structural detail.
  5. Provide crane service to hoist refrigeration equipment directly from truck to mounting position.
  6. Provide structural support for refrigeration equipment.
  7. Provide opening through the roof as applicable.
  8. Provide sheet metal refrigeration piping and conduit enclosure as shown on the drawings.
  9. Provide opening through outside building wall and provide weather hood as applicable.
  10. Setting condensing units in their proper locations level and anchoring them to building structure per structural detail.
  11. Setting condensing units and rooftop refrigeration racks in their proper locations, level and anchoring them to building structure per structural detail.
  12. Setting secondary pump skid units in the proper locations, level and anchored to building structure or slab per structural details.
  13. Hanging evaporator and/or secondary coils level and tight to ceiling. Route condensate drains tight to walls properly trapped and slope in direction of flow to a hub drain or floor sink.
  14. Installing case and walk-in cooler and freezer valves.
  15. Installing interconnecting refrigeration and secondary piping between cases, condensers, evaporator coils, and racks; clean and free from leaks with proper slopes, traps, and sizes.
  16. Installing refrigeration and secondary system piping supports as specified.
  17. Installing refrigeration and secondary system piping insulation as specified.
  18. Sealing and restoring vapor barriers for penetrations into walk-in boxes and cases. (Including electrical, alarm, communication, and sprinklers).
  19. Correctly labeling and tagging refrigeration system equipment and piping as specified, including installation of labels on all piping per ASME B31.1 Requirements.
  20. Removing and properly disposing of shipping materials, crating, skids, and other construction debris associated with refrigeration system installation.
  21. Submitting required regulatory forms in a timely manner, carefully and completely filled out.
    - a. Submit Refrigerant Data Collection forms at the end of commissioning week.
    - b. For refrigeration systems that include heat reclaim skid application, provide start-up completion forms at the end of commissioning week.
  22. Providing all equipment required for the unloading and installation of this scope of work.
  23. Systematically and thoroughly verifying refrigeration system control functions, sensor calibrations, and review construction activities for quality and completeness. Prepare refrigeration equipment for operation as part of Handover Document completion.
  24. Thoroughly and systematically pressure testing refrigeration systems. Evacuate and install oil and refrigerant charges. Maintain compliance with regulations governing handling of refrigerants.
  25. Verify performance of refrigeration systems as part of Handover Documents.
  26. Attach rooftop refrigeration equipment to structural support frame as shown on Drawings.

## 1.12 REQUEST FOR INFORMATION SUBMITTAL

- A. All Request for Information (RFIs) regarding Refrigeration shall follow the attached copy of the Request for Information Process Flow Chart.
- B. Refer to Specification Section 01255 for RFI Information Submittal Process.

#### 1.13 WARRANTY

- A. Provide warranty and service on equipment and materials installed regardless of whether equipment or materials were furnished by Contractor.
- B. Provide supplemental warranty service for all new rack systems. This service will include failures during installation and for 90 days beyond store Re-Grand Opening date. The supplemental warranty shall include labor, parts, primary refrigerant and secondary coolant for repairs to installed refrigeration equipment and piping.
  - 1. Response time to emergency calls shall be within two hours.
- C. For all new rack systems, perform inspection of installation 90 days after store Re-Grand Opening date or when all punchlist items are corrected (whichever is longer). Coordinate with MCM and Owner's Facilities Services to ensure owner's representative is present during walk. Contractor must provide at minimum one weeks' notice to owner prior to 90 day walk. Make necessary corrections and adjustments. Complete refrigeration punch list. Upload completed punch list to Owner's online construction management system *Wrike*.
- D. For all new rack systems, at 90 day inspection, include necessary lubrication, leak tests of all joints, flare nuts, and tightening of strapping as necessary. Perform leak test on small leak setting of refrigerant leak detector. Provide and change liquid line filter cores, oil system filter using Sporlan OF style filter, and replace suction filters. Place suction, liquid, and oil filters in a sealable plastic bag to prevent setting off any leak detection system. Perform oil acid test using either Virginia's TKO acid test kit (mineral or Alkylbenzene oil) or Virginia's ETK acid test kit (POE oil). For new rack house scenarios, oil test will be certified to meet OEM standards by Owner's Refrigeration Engineer of Record. If oil test results require an additional oil change, it will be performed by Owner. Leave oil filters in motor room for inspection by Owner's Mechanical Services Construction Manager. Contractor to properly dispose of oil and components replaced.
- E. It is required that contractor perform oil and refrigerant test prior to beginning project to establish baseline for oil/refrigerant quality. If oil/refrigerant test results at 90 day inspection requires an additional oil/refrigerant change, it will be performed by contractor at no additional charge to the owner. Contractor shall collect refrigerant sample from all systems and submit for testing. For all installations, all test results will be sent to OEM for approval. Final test results shall be posted in rackhouse.
- F. Owner's equipment manufacturer (OEM) supplier will furnish replacement parts for failures of OEM parts during installation period and for one year beyond store RE-Grand Opening date. Contractor shall obtain replacement parts from equipment manufacturer. Owner will not pay additional costs associated with repair or replacement of materials and parts during the warranty period.
- G. In the event the Contractor fails to respond to emergency calls within time lines outlined in the SLA(Service-Level Agreement) or fails to perform required maintenance or repairs during warranty period, the Owner will have the right to have the repair or maintenance performed by another contractor. In this case, the Contractor agrees to pay the Owner the invoiced amount of the services performed plus 15 percent.
- H. If the service contractor discontinues or drops their service level because the Contractor has failed to make payment to subcontractor on completed warranty work, Owner will remove that Contractor from New Stores Bid List until such time when all disputes or claims are settled.
- I. At the end of warranty period, certify in a letter to the Owner that equipment and materials installed or connected are functioning properly. Include certification that systems are free of leaks and are maintaining satisfactory temperatures at normal control adjustments.
- J. Reference Appendix A for any other Warranty references needed.

- K. Upon substantial completions, submit to the owner the name or names of qualified/approved local refrigeration service companies that will be authorized to handle warranty service. If warranty service performed by contractor is not of acceptable quality, the awarded contractor shall be liable for additional service as required to provide a functioning refrigeration system.

## PART 2 - PRODUCTS

### 2.1 OWNER FURNISHED PRODUCTS

- A. Owner will furnish refrigeration equipment as scheduled and shown on Drawings and as specified in Appendix A (Section 15600) for installation by the Contractor which includes, but not limited to, the following:
1. Condensers.
  2. Condensing Units.
  3. Evaporators.
  4. Unit Coolers.
  5. Compressor Rack Systems.
  6. Refrigerated cases.
  7. Secondary Glycol Skids.
  8. Secondary CO<sub>2</sub> Skids.
  9. Trans-critical CO<sub>2</sub> Systems.
  10. Self-contained Water-Cooled Cases.
  11. Fluid coolers.
  12. Rooftop Equipment Curbs
  13. Ice flakers.
  14. Produce misting system.

### 2.2 OWNER FURNISHED AND INSTALLED PRODUCTS

- A. Owner's walk-in manufacturer will furnish and install refrigeration equipment as scheduled and shown on Drawings which includes, but not limited to, the following:
1. Walk-in Freezers and Coolers.

### 2.3 MANUFACTURER'S WARRANTIES AND INSTRUCTIONS

- A. Nothing shall be done by the Contractor which will void any manufacturer's warranty.

### 2.4 MATERIALS (CONTRACTOR FURNISHED AND INSTALLED)

- A. Refrigerant Systems: Furnish and Install piping for refrigeration systems as specified in Schedule I below and as indicated on Drawings.
1. Refrigerant Copper Tubing and Fittings:
    - a. HFC System Piping:
      - 1) ASTM B 280, type ACR, hard drawn tubing. Tubing shall be factory cleaned, ready for installation, and have ends capped to protect cleanliness of pipe interior prior to shipping. Provide wrought copper pressure fittings, ANSI B16.22.
      - 2) Provide copper tubing from one of the following manufacturers:
        - a) [Cerro Flow Products](#).
        - b) [Mueller Industries/Mueller Streamline Co.](#)
        - c) [Wieland K65](#).
      - 3) Provide copper fittings from one of the following manufacturers:
        - a) [Mueller Industries/Mueller Streamline Co.](#)
        - b) [Nibco](#).
        - c) [NDL Industries](#).
        - d) [Wieland K65](#).
    - b. Trans-critical CO<sub>2</sub> System Piping:

- 1) ASTM B 280, type ACR, hard drawn tubing. Tubing shall be factory cleaned, ready for installation, and have ends capped to protect cleanliness of pipe interior prior to shipping. Provide wrought copper pressure fittings, ANSI B16.22.
- 2) Provide copper tubing from one of the following manufacturers:
  - a) [Mueller Industries/Mueller Streamline Co.](#)
  - b) [Wieland K65.](#)
- 3) Provide copper fittings from one of the following manufacturers:
  - a) [Mueller Industries/Mueller Streamline Co.](#)
  - b) [Wieland K65.](#)
- c. Secondary Overfeed CO2 System Piping:
  - 1) ASTM B 280, type ACR, hard drawn tubing. Tubing shall be factory cleaned, ready for installation, and have ends capped to protect cleanliness of pipe interior prior to shipping. Provide wrought copper pressure fittings, ANSI B16.22.
  - 2) Provide copper tubing from one of the following manufacturers:
    - a) [Mueller Industries/Mueller Streamline Co.](#)
    - b) [Wieland K65.](#)
  - 3) Provide copper fittings from one of the following manufacturers:
    - a) [Mueller Industries/Mueller Streamline Co.](#)
    - b) [Wieland K65.](#)
- d. Secondary Glycol System Piping:
  - 1) Reference Specification 15181 for hydronic piping material type, and flush fill requirements for secondary glycol skid piping.
  - 2) Secondary glycol system shall be flushed/filled and tested per Specification 15181.
  - 3) Insulate Secondary Glycol Piping Per Piping Insulation specifications and Schedule I below.
- e. Condensate Systems: Provide piping for condensate systems as specified in Schedule I below and as indicated on Drawings.
  - 1) Copper Tubing and Fittings: Type L, hard drawn tubing (Inside Refrigerated Walk-in Boxes Operating at 32°F or Below).
  - 2) PVC Piping and Fittings: ASTM D2665, schedule 40 drain, waste, and vent (Outside Refrigerated Walk-in Boxes and Inside Boxes Operating Above 32°F).

**B. Piping Insulation:**

1. Elastomeric Flexible Closed Cell Insulation: Maximum k factor at 50°F of 0.26 Btu-in/hr-ft<sup>2</sup>-°F, maximum flame spread and smoke development of 25 and 50, respectively per ASTM E84.
2. Provide one of the following, thicknesses as specified in Schedule I below:
  - a. AP Armaflex by [Armacell.](#)
  - b. Aerocel by Aeroflex USA, Inc.
  - c. Insul-Tube by K-Flex USA.
3. Cladded Insulation:
  - a. Provide cladded insulation for insulated exterior refrigerant piping and on walk-in freezer condensate piping with heating cable.
  - b. Provide insulation from the approved list of manufacturers with factory or field installed PVC jacketing or cladding. PVC jacketing or cladding shall match the insulation color requirements.
  - c. PVC jacketing and fitting covers shall be by one of the following:
    - 1) Proto PVC Fitting Cover System by Knauf Insulation
    - 2) Zeston PVC Fitting Cover System by Johns Manville,
4. Insulated tape, half lapped, triple reversed layered may be used to insulate valves, valve stations and factory installed piping components within cases.
5. Insulation color: Black.

<b>Schedule I</b>			
<b>Piping Service</b>	<b>Piping Size</b>	<b>Piping Material</b>	<b>Insulation Thickness</b>
R404A/R407A/R448A/R22 - Suction	1-3/8 inches and smaller	ASTM B280 Type L Hard Drawn Copper, Sealed ACR Tubing	1 inch
R404A/R407A/R448A/R22 - Suction	1-5/8 inches and larger	Type L Hard Drawn Copper, Sealed ACR Tubing	1-1/2 inch

Schedule I			
Piping Service	Piping Size	Piping Material	Insulation Thickness
R404A/R407A/R448A/R22 - Liquid	All	Type L Hard Drawn Copper, Sealed ACR Tubing	1/2 inch
R744 – Transcritical – Low Side Liquid	7/8 inches and smaller	Mueller Streamline Sealed ACR Tubing (rated at 700psi)	3/4 inch
R744 – Transcritical – Low Side Liquid	1-1/8 thru 2-5/8 inches	Mueller Streamline Sealed ACR Tubing (rated at 700psi)	1 inch
R744 – Transcritical – Low Side Suction	1-3/8 inches and smaller	Mueller Streamline Sealed ACR Tubing (rated at 700psi)	1 inch
R744 – Transcritical - Low Side Suction	1-5/8 thru 2-5/8 inches	Mueller Streamline Sealed ACR Tubing (rated at 700psi)	1-1/2 inch
R744 – Transcritical – High Side	All	Wieland K-65 (1740 psi rating) or Mueller XHP (>1600 psi rating) Sealed ACR Tubing Verify AHJ Approval	N/A
Evaporator Condensate - Inside Refrigerated Walk-in Boxes Operating at 32°F or Below	All	Type L Hard Drawn Copper	1 inch
Evaporator Condensate - Outside Refrigerated Walk-in Boxes and Inside Boxes Operating Above 32°F	All	Schedule 40 PVC, Solid Core, DWV	N/A

C. Refrigerant Valves:

1. CO<sub>2</sub> Systems (Trans-critical and Secondary Overfeed):
  - a. Isolation valves shall be full port ball type valves, with a minimum working pressure of 700 PSIG, a working temperature range of -40°F to 300°F, and specifically designed for use with the refrigerant that is contained within the system. The valve body shall be forged brass and hermetically sealed. Bolted body valves are not permitted.
  - b. Valves shall be rated for operation in the Trans-critical CO<sub>2</sub> operations.
  - c. Provide valves as manufactured by one of the following:
    - 1) Henry Technologies.
    - 2) Mueller Industries.
    - 3) NDL Industries, Inc.
2. HFC Refrigeration Systems:
  - a. Isolation valves shall be full port ball type valves, with a minimum working pressure of 700 PSIG, a working temperature range of -40°F to 300°F, and specifically designed for use with the refrigerant that is contained within the system. The valve body shall be forged brass and hermetically sealed. Bolted body valves are not permitted.
  - b. Valves shall be rated for operation in the Trans-critical CO<sub>2</sub> operations.
  - c. Provide valves as manufactured by one of the following:
    - 1) Henry Technologies.

- 2) Mueller Industries.
- 3) NDL Industries, Inc.
3. Secondary Glycol Systems:
  - a. Reference Specification 15181 or plans for valve types.
  - b. Manual balance valves shall not be used, wherever specified on plans, Auto-flow balance valves shall be used.
- D. Pipe Freeze Protection:
  1. Heating cable shall be self regulating, 120 volt, 5 watts per linear foot.
  2. Provide one of the following:
    - a. Raychem XL-Trace by [Tyco Thermal Controls, LLC](#).
    - b. CO Series by [Delta-Therm Corporation](#).
- E. Refrigerants and Oils:
  1. Refrigerant: As specified on Refrigeration Equipment Schedules and certified to meet AHRI 700 standard for chemical purity. Deliver refrigerant in original containers.
  2. Refrigerant Oil: Approved for use by compressor manufacturer, with refrigerant and compressors for the application. Do not put oil in systems from containers that have been left uncapped for an extended period of time.
- F. Carbon Dioxide (TCO<sub>2</sub>):
  1. Carbon dioxide shall be 99.99% pure or higher and labeled as Refrigerant grade R-744.
  2. Moisture content shall be <10 PPM
- G. Sheet Metal Piping Enclosure: Provide galvanized sheet metal refrigeration piping and conduit enclosure as shown on Drawings.
- H. Sheet Metal Drain Pans: Provide galvanized sheet metal drain pans under refrigeration piping penetrations thru roof as shown on the drawings.
- I. Installation Accessories: Provide accessories required for piping installation as required and as specified in Part 3 hereinafter.
- J. Solder and Flux:
  1. Solder: Min. 6% silver content lead-free solder, Stay-Brite #8 by Harris Products Group or similar. (6% solder only for condensate lines)
  2. Flux: Water soluble flux conforming to ASTM B 813; Aqua-Brite Flux or similar.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. General Installation Requirements:
  1. Equipment:
    - a. Install refrigeration equipment in accordance with manufacturer's instructions.
    - b. Attach rooftop refrigeration equipment to structural support frame or roof curb as shown on Drawings.
    - c. Pipe routing, case, condenser, and compressor rack locations shall not deviate from Drawings without approval from Owner's Mechanical Construction Manager.
  2. All Piping:
    - a. Locations and Arrangements: Drawings (plans, schematics, and diagrams) indicate the general location and arrangement of piping systems. Locations and arrangements of piping take into consideration pipe sizing and friction loss, expansion, pump sizing, and other design considerations. So far as practical, install piping as indicated.
    - b. Install piping in a neat and workmanlike manner with pipe sizes as indicated on the drawings.
    - c. Inspect materials to verify they are free of defects, grease, and foreign particles; comply with the temperature and pressure rating of the system; and are compatible with the refrigerant in the system.

- d. Suspend refrigeration piping as shown on Drawings, with supports spaced in accordance with the requirements of Section 15050.
  - e. Ream cut ends to full interior diameter and remove burrs created during cutting process.
  - f. Remove oxides and surface soil from pipe ends and fitting cups with abrasive cloth, abrasive pads, or properly sized fitting brush.
  - g. Install piping with sufficient flexibility to allow for expansion and contraction due to temperature fluctuations inherent in operation of these types of refrigeration systems. Install piping to prevent vibration and undue strain on pipe and fittings.
  - h. Maintain refrigerant piping clean and dry. Keep piping sealed when not working directly at a specific location or joint. Do not leave open refrigerant piping ends unattended during installation process. Fitted joints exposed to the exterior of the building shall be brazed the same day they are fitted. Visibly inspect pipe and fitting prior to assembly. Swab as necessary with cleaning solvent soaked cloth to remove dirt, filings, or visible moisture.
  - i. Prevent piping contact at pipe crossings by use of offset and/or insulation. Refrigerant piping shall not contact electrical conduit or other dissimilar grounded metals.
  - j. Provide branch supply and return line ball valves for isolation purposes as indicated on refrigeration piping plans. Install valves in a fully accessible location. Insulate isolation valves in accordance with refrigeration line insulation requirements.
  - k. Install exposed piping at right angles or parallel to building walls. Diagonal runs are not permitted unless expressly indicated.
  - l. Conceal all pipe installations in pipe chases, utility spaces, and above ceilings, unless indicated to be exposed to view.
  - m. Install horizontal piping as high as possible allowing for specified slope and coordination with other components. Install vertical piping tight to columns or walls. Provide space to permit insulation applications where required, with one inch clearance outside the insulation. Allow sufficient space above removable ceiling panels to allow for panel removal.
  - n. Locate groups of pipes parallel to each other, spaced to permit applying insulation and servicing of valves.
  - o. Secure vertical refrigerant piping installed outside building walls to Unistrut fastening system with #022 Cush-a-Clamps. Fasten clamps directly to copper pipe, not to outside of insulation. Butt insulation against clamp and insulate uncovered.
  - p. In general, clamps are not required on horizontal piping. However, horizontal piping that is vertically supported without support directly under the piping shall be clamped.
  - q. Make copper piping soft solder joints with specified solder and flux. Clean joints before soldering.
  - r. Make brazed joints with use of brazing alloy containing minimum of 15% silver. Clean joints before brazing and have dry nitrogen at 1/2 psi pressure flowing through tubing during brazing.
  - s. Protect affected valves and control devices during brazing process by disassembling and removing heat sensitive parts or use of heat shields.
  - t. Install replacement parts (i.e. expansion valves, heat exchangers, sight glasses) using specified solder, excluding parts in hot gas lines. Use heat dams in all instances.
  - u. Owner's Mechanical Construction Manager shall visually inspect refrigerant piping and insulation prior to being covered.
  - v. Piping deemed by the Owner's Construction Manager to be installed incorrectly shall be corrected at Contractor's expense.
  - w. All condenser piping shall be clamped with high temp cush-clamps (HT-CUSH-A-NATOR or similar).
  - x. Install refrigerant tubing connector system accessories and products in accordance with manufacturer's published instructions per ASTM B 280.
  - y. Connect piping and fittings in accordance with refrigerant tubing connector systems manufacturer's instructions using specialty tools as required and recommended by the manufacturer per ASTM B 280.
3. Insulation:
- a. Install refrigeration piping insulation in accordance with ASTM C 1710, manufacturer's recommendations and per schedule I including glued and taped joints.
  - b. Ensure that temperature and other environmental conditions are favorable for installation of insulation materials.

- c. Coordinate with other trades so that work is performed with minimum interference and conflict. Carefully note heat tracing and pressure testing procedures prior to installation of insulation materials. Do not apply insulation covering pipe or fitting joints until after pressure testing affecting those joints has been completed and approved by Owner's Mechanical Construction Manager and Authority Having Jurisdiction.
  - d. Do not apply insulation until surfaces are clean, dry, and free of dirt, grease, moisture or other impurities such as corrosive cleaners and dust. Seal refrigerant pipe openings while installing insulation to prevent foreign material from entering tubing.
  - e. Insulation work shall be performed by trained installers regularly engaged in insulation trade.
  - f. Cleanly and squarely cut insulation joints. Do not tear insulation.
  - g. Install piping insulation continuous through sleeves and penetrations (walls, partitions, roofs, ceilings, and floors).
  - h. Seal seams, butts, and ends to retard moisture vapor from entering system. Glue joints with approved products. Do not stretch insulation as it is being installed and glued.
  - i. Vapor stop exposed ends and every 12 feet by applying approved contact adhesive to outside surface of piping and inside surface of insulation and secure to piping.
  - j. Insulate fittings, flanges, and valves with same insulation thickness as adjacent piping.
  - k. Insulate valves to a point just below seal cap or packing gland. Seal insulation to valve body with contact adhesive.
  - l. Slip insulation over pipe before making joints. Split type insulation is acceptable on fittings only. Provide factory pre-manufactured insulation fittings. Where pre-manufactured fittings are unavailable, miter cut fittings shall be used with approval of Owner's Mechanical Construction Manager. Install insulation in conformance with manufacturer's recommendations, including glued and taped joints. If receiver is mounted outside, provide UV protection for pipe insulation on the liquid line from the receiver to the refrigeration rack by application of a covering or coating specifically for the purpose of UV protection and as recommended by the manufacturer.
  - m. Cover exterior refrigerant pipe insulation (including heat reclaim lines) and interior prep room lines with .020 inch thickness UV inhibited PV jacketing and fitting covers. Seal jacketing against vapor and weather.
  - n. Install insulation in such a manner to ensure a properly functioning system. Reinstall an installation that is deemed unacceptable by the Owner's Mechanical Construction Manager.
4. Penetrations:
- a. Seal penetrations through exterior building walls and walk-in coolers and freezers with urethane foam and silicone caulk as specified in Section 07900 and as detailed on Refrigeration Drawings.
  - b. Fire Barrier Penetrations: where pipes pass through fire rated walls, partitions, ceilings, and floors, maintain the fire rated integrity. Provide fire stopping in compliance with the requirements of Section 07840.
5. Electrical:
- a. Make final electrical connections, including slave wiring, to refrigerated cases, evaporators, field installed refrigeration control valves, defrost heaters, cooler and freezer box door lights and anti-sweat heaters, and compressor houses. Make connections per wiring diagrams and instructions from equipment supplier. Comply with the requirements of Section 16100 and applicable electrical codes.
6. Control Tubing:
- a. Install tubing such that there is sufficient slack. Avoid stretching and sharp bends. Properly support tubing away from contact with sharp or abrasive objects.
  - b. Always connect control tubing to refrigeration system or components through a service valve.
  - c. Remove breakaway Schrader valve depressor.
  - d. Do not over torque flare nuts.
7. Transcritical CO<sub>2</sub> Piping:
- a. Install liquid solenoids, expansion valves, isolation valves, check valves, thermostats, and heat exchangers as indicated on Drawings. Provide sufficient pipe at evaporator outlet to install sensing bulbs, pressure transducers, sensors, and other devices as specified in respective manufacturer documents.
  - b. P-Traps shall be one piece, long radius type at bottom of risers. Size P traps to match horizontal pipe or coil outlet pipe. Do not reduce trap to riser size. Take vertical risers as high as possible (just below structure). On risers above 16 feet, provide double oil traps spaced as shown on Drawings.
  - c. Pitch horizontal suction lines minimum of one inch per 20 feet of run in direction of refrigerant flow. Ensure no oil traps are formed in piping layout.



- d. Suction lines and return lines that are teed into a common return line shall be teed into the top. Liquid lines shall come off of the bottom.
  - e. Provide service access valve (non-Schrader type) access on each suction line leaving evaporators.
  - f. Verify service access valves have cores securely installed and caps are installed.
  - g. Install all shipped-loose rack manufacturer-provided pressure relief valves. Contact manufacturer if no pressure relief valves were provided. Do not start-up system without pressure relief valves installed.
8. DX System Installation Requirements:
- a. Install electronic suction pressure regulator valves, thermostatic expansion valves, liquid solenoids, thermostats, and heat exchangers. Provide sufficient pipe at evaporator outlet to install thermostatic expansion valve sensing bulb, ensuring 100% contact with pipe.
  - b. P-Traps shall be one piece, long radius type at bottom of risers. Size P traps to match horizontal pipe or coil outlet pipe. Do not reduce trap to riser size. Take vertical risers as high as possible (just below structure). On risers above 16 feet, provide double oil traps spaced as shown on Drawings.
  - c. Pitch horizontal suction lines minimum of one inch per 20 feet of run in direction of refrigerant flow. Ensure no oil traps are formed in piping layout.
  - d. Liquid supply line tees shall be bullheaded inside cases. Suction lines shall not be bullheaded.
  - e. Install 1/4 inch packed angle king valve on top of inverted trap on inlet side of field installed condensers. Install valve at highest point in the discharge line. Provide packed angle valves with brass or steel caps.
  - f. Suction lines and return lines that are teed into a common return line shall be teed into the top. Liquid lines shall come off of the bottom.
  - g. Provide Schrader valve access on each suction line leaving evaporators.
  - h. Verify Schrader valves have cores securely installed and caps are installed.
- B. Condensate Piping System Installation Requirements:
- 1. Provide condensate lines from evaporators to outside of walk-in freezers and coolers, and adapt to individual PVC trap.
  - 2. Clean markings off of PVC with solvent.
  - 3. Install self-regulating heating cable and insulation on condensate drains inside walk-in boxes that are to operate at or below 32°F.
    - a. Provide one of the following:
      - 1) Raychem XL-Trace by Tyco Thermal Controls, LLC.
      - 2) CO Series by Delta-Therm Corporation.
  - 4. Provide semi-rigid PVC insulation jacket on piping with heating cable. Provide one-piece, pre-molded PVC cover conforming to ASTM D1784, including factory furnished, pre-cut insulation blanket inserts for fittings.
  - 5. Install unions on condensate drains in walk-ins close to drain pan.
  - 6. Allow clearance for evaporator drain pans to hinge open. Install common condensate header outside the walk-in and terminate condensate lines into header.
  - 7. Paint non-insulated copper drain lines to match walk-in box.
  - 8. Maintain slope of one-eighth inch per 12 inches of horizontal run or as specified by evaporator coil manufacturer's installation instructions (whichever is larger) for condensate lines.
- C. Hangers and Supports:
- 1. Install hangers, supports and anchor devices as specified in Section 15050.
  - 2. Install hangers and supports to allow controlled movement of piping systems, permit freedom of movement between pipe anchors, and accommodate normal expansion and contraction due to changes in temperature.
  - 3. Install hangers and supports so that piping live and dead loading or stresses from movement are not transmitted to connected equipment.
  - 4. Install hangers for insulated pipe sized to encompass insulation including support shields.
  - 5. Where pipes of various sizes are supported together by trapeze hangers, space hangers for the smallest pipe size or install intermediate supports for smaller diameter pipes.
  - 6. Adjust hangers to distribute loads equally on attachments and achieve the indicated slope of piping.
  - 7. Remove sharp edges and burrs from refrigeration system hangers and supports.
  - 8. Remove excessive rod materials from hangers that protrude 2 inches or more from the hangers after adjusting and pitch have been established.

9. Install trapeze hangers not farther than two feet on each side of 90 degree turns.

### 3.2 IDENTIFICATION

#### A. Evaporator Identification:

1. Provide engraved plastic identification tags 2 inch by 3 inch in size, attached with screws, pop rivets, or adhesive to evaporator.
2. Identify circuits with corresponding number and circuit from BAS plans.
3. Identify cases with an approximate location of field installed control valves.
4. Identify with tags all EDC circuits and panel locations.

#### B. Case and Walk-In Identification:

1. Provide engraved plastic identification tags 2 inch by 3 inch in size, attached with screws, pop rivets, or adhesive.
2. Identify circuits with corresponding number and circuit from BAS plans.
3. Identify cases with an approximate location of field installed control valves.
4. Identify with tags all EDC circuits and panel locations.
5. Order and install Walmart Asset tags as specified in Section 15050. Input data using the Asset Data Collection Application as specified in Section 15050.

#### C. Refrigeration Equipment Identification:

1. Provide engraved plastic identification tags 2 inch by 3 inch in size, attached with screws or pop rivets.
2. Identify refrigeration equipment, including compressor houses, racks, condensers, sensor or thermostat locations, and hot water tanks.
3. Valve Nameplates: Provide factory custom-stamped metal identification tags for field installed refrigeration system control valves and flow sensors as scheduled on the drawings.
4. Tags shall be brass material and shall be securely attached to valve or sensor body.
5. Provide tags by Emedco.com, (866) 222-4743 or equivalent.

#### D. Nameplates and labels shall be installed prior to refrigeration system start-up.

### 3.3 CASE SETTING

A. Set cases level and in line with transit. Shim at each vertical support or at maximum four foot intervals with galvanized plates, as floor conditions require (both front and rear rail). When shimming glass door cases, lean cases back 1/4 to 1/2-inch to ensure case stability when loaded. Where manufacturer's installation instructions differ from Owner's specifications, consult with Owner's Mechanical Construction Manager.

B. Install cases per manufacturer's installation instructions. In addition, apply butyl caulking compound all around case joints. Reseal joints if seal is broken.

C. Install a bead of butyl sealant and cover with clear tape on the top and back exterior joints for glass door cases.

D. Install a finish bead of silicone on interior case joints (bottom, back and interior top of case). Sealant shall match case interior color.

E. Do not cut bottom case rails (No Exceptions).

F. Hang case shelving and place pans in refrigerated cases, including door shelving in dairy cooler.

G. Prior to setting new refrigerated cases, thoroughly clean all debris from floor drain and/or floor sink grates and bodies. Hydro-Jet each floor drain and/or floor sink to the main. Refer to drawings for video camera scope requirement.

### 3.4 WALK-IN COOLER/FREEZER EVAPORATOR COILS

- A. Examine areas to receive equipment, review proposed locations of equipment and piping, and verify that they are free of interferences. Comply with requirements for installation tolerances and other conditions affecting unit performance.
- B. Locations of equipment on Drawings are approximate. Field verify exact locations before roughing in piping and electrical work.
- C. Accurately layout, mark, and drill necessary holes in walk-in box panels. Cut holes only with drill bits and hole saws. Cut holes only as large as required to accommodate pipes, hanger rods, and conduits, refer to drawing detail for piping penetrations.
- D. Hang or mount evaporator coils plumb and level in accordance with manufacturer's instructions and Refrigeration Drawings.
- E. Maintain manufacturer's recommended clearances so as to not restrict air flow.
- F. Support piping separately so that piping is not supported off of evaporator coil units.
- G. Install electrical devices furnished by manufacturer.
- H. Install interconnecting refrigeration piping between evaporator coils and refrigeration piping.
- I. Install evaporator outlet suction line with adequate length, located before suction line oil trap for installation of the expansion valve sensing bulb. Bulb must have 100% direct contact with refrigeration suction line and not installed on any braze joint. The expansion valve sensing bulb straps must be installed per manufactures recommendations to insure proper operation of the expansion valve.
- J. Install walk-in cooler/freezer refrigerant sampling intake devices and necessary interconnecting tubing back to refrigerant detection units.
- K. Install condensate lines for walk-in coolers/freezers.
- L. Install heat trace and insulation for condensate drain lines in walk-in coolers/freezers operating below 32 F.
- M. Jacket for heat trace and insulated condensate drain lines in walk-in cooler/freezer shall be Semi-rigid PVC: One-piece, pre-molded PVC cover conforming to ASTM D1784, including factory-furnished, pre-cut insulation blanket inserts for fittings.
- N. Fit condensate lines in walk-in coolers/freezers with a union to facilitate cleaning of condensate line and removal of evaporator coil drain pan.

### 3.5 TESTING, EVACUATING, CHARGING, AND FILLING DX REFRIGERANT SYSTEM

- A. Notify Owner's Mechanical Construction Manager 72 hours in advance of pressure/vacuum and evacuation tests.
- B. Testing:
  1. When refrigeration connections have been completed, test refrigerant piping system for leaks with dry nitrogen at a minimum of 150 PSIG, but not to exceed 200 PSIG, with all valves in the system open except compressor suction and discharge relief valves, and transducers which must be kept closed during pressure testing and evacuation procedures.
  2. When refrigeration connections have been completed, test refrigerant piping system for leaks with dry nitrogen at a minimum of 550 PSIG, but not to exceed 625 PSIG, with all valves in the system open except compressor suction and discharge relief valves, and transducers which must be kept closed during pressure testing and evacuation procedures.
  3. Physically test all joints with a soap solution.
  4. System shall hold maximum pressure for a minimum of 1 hour on overnight changeouts and 24 hours for rack changeouts and projects where new circuits are being added.

5. If leaks are found, isolate leaks, discharge gas, repair leaks, and then repeat test.
6. Do not release pressure until making final connections.
7. Refrigeration piping will not be accepted or signed off unless it is gas tight and free of leaks.

C. Evacuating:

1. Evacuate system with a 2 stage vacuum pump specifically manufactured for vacuum duty and having capacity of at least 6 CFM and the capability of pulling vacuum of 50 microns or less within a 24 hour period. Do not evacuate system by use of the refrigeration compressor. Connect pump to both low and high side evacuation valves with copper tube. Compressor service valves shall remain open. Attach high vacuum gage, capable of registering pressure in microns, to system for pressure readings. Do not operate hermetic or semi-hermetic motor compressors during evacuation because of reduced electric strength of atmosphere within motor chamber. To check system pressure, provide hand valve between pressure gage and vacuum pump which can be closed to isolate system and check pressure.
2. Isolate transducers from vacuum testing.
3. Evacuate each system to an absolute pressure not exceeding 1,500 microns.
4. Break vacuum to 2 PSIG with dry nitrogen.
5. Repeat evacuation process two more times.
6. Install drier of required size in liquid line.
7. Leave vacuum running for not less than two hours without interruption, valve off, and remove vacuum pump.
8. Evacuate system to 500 microns and hold for 24 hours.
9. Evacuate system to 250 microns and hold for 24 hours. Provide documentation to OEM as required.
10. Verify vacuum procedure and test with Owner's Mechanical Construction Manager.
11. Break final vacuum to 2 psig with specified refrigerant.

D. Charging and Filling:

1. Provide primary refrigerant as indicated on refrigeration Drawings and as required for proper operation of systems. Check the refrigeration Drawings and the equipment manufacturer's labeling prior to charging of refrigeration system.
2. Charge refrigerant directly from original containers.
3. Charge system according to OEM procedures.
4. Record amount of refrigerant used on Owner provided Refrigerant Data Collection form. Email to [mcequip@walmart.com](mailto:mcequip@walmart.com) and upload to Owner's online construction management system *Wrike*.
5. Contractor shall not use Owner owned refrigerant gasses to charge system.
6. Write refrigerant charge per rack in black indelible marker on each system compressor breaker panel.
7. Fill compressors with oil to manufacturer's recommended levels and fill oil reservoirs to 1/2 full. Top off the reservoirs with oil after the system has run for a minimum of 24 hours.
8. Refrigerant charge shown on Refrigeration Drawings is a calculated estimate only. Fully charge refrigeration system at start-up.
9. Ending Complete refrigerant charge shall be the same as exact receiver level at the start of the project. Contractors shall take pictures to prove receiver level percentage at start of project.

### 3.6 TESTING, EVACUATION, AND FILLING TRANSCRITICAL CO2 SYSTEM

- A. When refrigeration connections have been completed, test CO2 system for leaks with dry nitrogen at minimum of 600 PSIG, with compressor suction and discharge valves closes, and all other valves in systems open, with exception of transducers which must be kept closed during pressure testing and evacuation procedures. Hold pressure for 24 hours. If leaks are found, isolate leaks, discharge gas and repair leaks, and then repeat test.
- B. Evacuate system with vacuum pump specifically manufactured for vacuum duty, having capability of pulling vacuum of 50 microns or less, and minimum 10CFM. Evacuate each system to a target 250 microns and an absolute pressure not exceeding 500 microns. Do not pull vacuums on transducers. Break vacuum to 2 PSIG with 99.99% purity CO2. Repeat evacuation process, again breaking vacuum with industrial grade 99.99% purity CO2. System shall hold vacuum without exceeding 500 microns for twenty-four hours. Raise system pressure to 250 PSIG with 99.99% purity CO2 vapor prior to charging with liquid.

- C. Charge CO2 thru filter/drier provided by OEM. After start-up, purge non-condensable gases from system per manufacturer's start-up procedure. After charging the system, evacuate the remote charging line to 500 microns before closing shutoff valves.

### 3.7 PRE-START-UP

- A. Document the following Pre-Start-Up information, at a minimum, on Handover Documents
  1. Check all electrical connections at rack. Turn main breaker OFF and verify that no power is present at all three legs with a meter. Verify tightness of all electrical connections.
  2. Check main power voltage across each supply leg at the compressor rack. Voltage shall be within 10 percent of required.
  3. Check control voltage.
  4. Energize system for 24 hours in advance of starting any compressor, make sure compressor crankcase heaters are operational.
  5. Verify cleanliness of evaporator coils
  6. Verify proper expansion valve installation.
  7. Verify that evaporator and condenser fans are clear of debris.
  8. Verify evaporator fan operation.
  9. Verify that case, walk-in cooler/freezer doors close properly and are closed.
  10. Verify operation of case lights and switches.
  11. Verify that door seals are not damaged.
  12. Verify high and low pressure control settings.
  13. Verify that field wiring connections have been completed.
  14. Verify condenser pressure fan cycling control operation.
  15. Verify correct condenser fan rotation.
  16. Verify temperature set-points.
  17. Verify alarm set-points.
  18. Verify defrost schedule.
  19. Verify that compressor discharge service valve is fully open.

### 3.8 NEW SYSTEM START-UP

- A. Refer to equipment manufacturers start-up documentation for additional requirements.
- B. Schedule start-up so that refrigeration systems are operational and running prior to manufacturer representative visit to perform system commissioning with the Contractor.
- C. Include qualified service technicians, necessary tools, and other supplies required by manufacturer's field service representative to perform commissioning activities identified in Contract Documents.
- D. Conduct system start-up as follows:
  1. Adjust valves, expansion valves, liquid hold-back valves, balance valves, compressor high and low pressure switches, receiver pressurization, and subcooler outlet pressure regulator.
  2. Complete refrigerant and oil charge.
  3. Adjust oil float levels and replace liquid, suction, and oil line filter/dryers.
  4. Verify pressure and temperature gauges are accurate.
- E. Start-up consists of but may not be limited to the following items:
  1. Adjust/verify operation of all control valves; EPR/EEPR, TXV/EEV, LPR/ELPR, Electronic/Mechanical condenser flooding valves, receiver pressurization valves, etc.
  2. Verify that compressor amperage is balanced and is within normal operating range per OEM specification.
  3. Verify that compressor net oil pressure is within OEM specified range.
  4. Adjust/verify operation of compressor high and low pressure switches.
  5. Complete refrigerant and oil charge.
  6. Adjust oil levels in oil separator/reservoir and individual compressor oil level controls to correct levels, adjust oil supply pressure regulating valve to OEM specified differential setting.
  7. Confirm correct condenser operation; fans control, VFD, split, etc.

8. Confirm correct subcooler operation; EEV/SH, EEPR suction pressure, liquid outlet pressure regulator, etc.
  9. Pressure and temperature gages shall be accurate.
  10. All work being completed on Remodel and Cap-x project case and equipment replacement must be completed during owner established work hours of 9:00p.m to 7:00am Sunday-Thursday unless otherwise arranged with Owner's Mechanical Construction Manager. All work must be completed, work area cleaned and all equipment in full operation to be turned over to owner at 7:00 a.m. on the same work day.
  11. Perform an oil/refrigerant test on all systems that have been opened to atmosphere and report to Owner's Mechanical Construction Manager the results of oil/refrigerant test. If acid is present take immediate measures to protect owner's equipment and remove contaminated refrigerant and oil and filters and driers, at no extra expense to owner.
  12. All filters and driers shall be changed according to owner's specifications, including but not limited to suction filters, liquid driers, oil filter, coalescing separator filter, etc.
- F. After compressor is started, continue charging until system has sufficient refrigerant for proper operation. Do not charge receiver level past 40%. Do not leave compressor operating unattended and unmatched until system is properly charged with refrigerant and oil. Charge receivers to 30 percent with unit in heat reclaim in 100 percent condenser and condenser fan controls set properly. Maintain these levels throughout maintenance service period. If at end of maintenance period, receiver level has dropped, completely re-check refrigeration rack, piping, and case system for leaks. Repair leaks and bring system back to original charge level.
  - G. Do not add oil while system is short of refrigerant unless oil level is inadequate for system operation.
  - H. Set expansion valve superheat on systems per refrigeration drawings. Balance multi-plex systems to within 2°F of target and with not more than 2°F variation in discharge air temperature between cases. Verify superheat settings after fixtures have been loaded with product.
  - I. Prior to opening any rack systems to add or replace cases, evaporators, etc, install new suction filter in the suction line canister. Then 24 to 48 hours after the work is completed and all final adjustments have been made, provide and change liquid line filter cores, oil system filter using Sporlan OF style filter, and suction filters. Filters are to be rated for wax removal. Contractor to properly dispose of oil and components replaced.
  - J. Test and adjust controls to ensure a refrigeration system operating to Owner's design specifications.
  - K. Verify refrigeration alarm system is functioning correctly 24 hours prior to food delivery.
  - L. Complete system balance by the end of the fifth day of start-up.
  - M. Complete Refrigeration Installation Handover Document / Sign Off Sheet and submit as specified in Part 1.
  - N. Final payment will not be made until Refrigeration Installation Handover Document / Sign Off Sheet and Refrigerant Data Collection documentation is received and job notebook is completed and placed in the mechanical refrigeration house.
- 3.9 REFRIGERATED CASE START-UP
- A. Refer to equipment manufacturers start-up documentation for additional requirements.
  - B. Evacuate refrigeration compressor rack and associated piping prior to adding refrigerant charge.
  - C. Evacuate condensing units and associated piping prior to adding refrigerant charge.
  - D. Verify line voltage and check motor rotation prior to operation.
  - E. Operate equipment controls and safeties to verify proper function. Adjust valves and controls to place units in full operation.
  - F. Verify that motor amperages and air flow rates for condensing units agree with manufacturer's data.

G. Complete Handover Documents.

### 3.10 REFRIGERATED CASE/COIL WITH INTEGRATED CONTROLS START-UP REQUIREMENTS

A. Refer to equipment manufacturers start-up documentation for start-up requirements.

B. Installing contractor to test each case at start-up using the manufacturer's user interface and OEM-provided start-up documentation. The purpose of this start-up is to confirm correct control parameters and component operation before cases are turned over and loaded with product. Contractor's test shall be completed at start-up to prevent product and sales loss.

1. Contractor's certification and access to the Sporlan Tech Check mobile application is described in Part 1 herein.

C. The FPT will include verification of the following.

1. The following Controls parameters shall be verified per the BAS drawings for accuracy.

- a. Superheat Target.
- b. Control Temp (Both Medium and Low temp for Dual temp cases).
- c. Defrost Termination Temp.
- d. Defrost Schedule/Frequency.
- e. Defrost Failsafe time.

2. Verify the following components and operations.

- a. Sensors:
  - 1) Discharge Air Temperature.
  - 2) Return Air Temperature.
  - 3) COT/ Suction Temp.
  - 4) Defrost Termination.
  - 5) Suction Pressure.
- b. Defrost:
  - 1) LLSV.
  - 2) EEV.
  - 3) EEPR.
  - 4) Fan Operation: Cycling/Delay.
  - 5) Heaters.

3. Verify Case/Walk-In performance:

- a. Discharge Air Temperature within specification.
- b. Return Air Temperature within specification.
- c. Suction Temperature (coil outlet) within specification.
- d. Confirm Suction Pressure Transducer reading.
- e. Suction Pressure drop between case/coil and rack suction pressure transducer does not exceed 3 psi.
- f. EEPR modulates to maintain target temperature.
- g. Superheat performance within specification.
- h. Case/Coil Controller is free of faults or alarms.
- i. Leak Detection System is operational and free of alarms (Walk-In Only).
- j. Case lighting is operational.
- k. Cases are free of excessive condensation.
- l. All cases on single circuit operate within 2°F of target temperature.

4. Verify System Performance:

- a. Confirm compressor replacement(s) were completed (if applicable) and are operational.
- b. Confirm compressor unloaders are operational (if applicable).
- c. Confirm rack unloading schedule was revised (if applicable).
- d. Rack refrigerant receiver level is greater than 20% during observation and rack controller is free of receiver level alarms.
- e. Oil reservoir level is within specification.
- f. Rack operating superheat is within specification.

5. Complete Case Checkout Documentation.

D. Complete Handover/Closeout Documents.

### 3.11 CONDENSING UNIT START-UP

- A. Refer to equipment manufacturers start-up documentation for additional requirements.
- B. Evacuate refrigeration compressor rack and associated piping prior to adding refrigerant charge.
- C. Evacuate condensing units and associated piping prior to adding refrigerant charge.
- D. Verify line voltage and check motor rotation prior to operation.
- E. Operate equipment controls and safeties to verify proper function. Adjust valves and controls to place condensing units in full operation.
- F. Verify that motor amperages and air flow rates for condensing units agree with manufacturer's data.
- G. Complete Handover Documents.

### 3.12 EVAPORATIVE CONDENSER START-UP

- A. Refer to equipment manufacturers start-up documentation for additional requirements.
- B. Evacuate evaporative condensers and associated piping prior to adding refrigerant charge.
- C. Verify line voltage and check motor rotation prior to operation.
- D. Verify line voltage to the water treatment panel.
- E. Operate equipment controls and safeties to verify proper function. Adjust valves and controls to place evaporative condensers in full operation.
- F. Verify that motor amperages, air flow rates, supply water pressure, and water flow for evaporative condensers agree with manufacturer's data.
- G. Start-up to include passivation and monitoring of condenser coil and cabinet for 30 – 60 days as required to complete passivation of galvanized steel. The upper section of the condenser coils should be photographed prior to start-up and every other week for the first 4 to 8 weeks of operation. Photographs should be forwarded to the Owner's Mechanical Construction Manager. Operation of the recirculation pump and water treatment system, without load, for 2 to 4 weeks is required to minimize the formation of white rust. Refer to manufacturer's submittals for guidelines on water characteristics to be maintained during the passivation process. During this time, circulation pumps, make-up water systems, water treatment systems and conductivity controls must be operational to properly treat make-up water and control tower blow-down rate.
- H. Complete Handover/Closeout Documents.

### 3.13 CONTRACT COMPLETION, STORE POSSESSION AND RE-GRAND OPENING DAY

- A. Coordinate and execute the Handover/Closeout Documents as soon as final system adjustments are completed.
- B. Finish work and furnish Owner's Construction Manager with a complete and operating refrigeration system at Contract Completion.
- C. Owner may take possession of completed or partially completed portions of work although time allotted for completion of work may not have expired. Taking possession of work shall not be deemed acceptance of any work that has not been completed in accordance with Contract Documents.



- D. Temperature and valves shall be adjusted and control strategies modified as necessary as cases are loaded with product and conditions within store environment change.
- E. Have a mechanic on job site from 7:00 AM to 6:00 PM on the day before Re-Grand Opening and the day of Re-Grand Opening. Mechanic shall check in with both the Store Manager and the Field Project Manager when arriving and prior to leaving.

#### 3.14 FIELD QUALITY CONTROL

- A. Maintain a clean and orderly work area. On a daily basis remove from jobsite scrap, waste, and debris resulting from refrigeration field work.
- B. Installation materials shall be new and without defect. If requested, Contractor shall submit evidence as to quality of systems built, including but not limited to, material test reports, packing slips, material data sheets, employee qualification and training documentation records, brazed joints, insulation mock ups, leak testing and electrical function testing records.
- C. Prior to concealing joints with insulation or piping in walls, floors, or ceilings, clean and test piping in accordance with these specifications. Piping shall be leak-free.
- D. Contractor shall assure quality of brazing done by their organization and shall employ skilled craftsmen following qualified brazing procedures. If directed by the Owner's Mechanical Construction Manager, cut out five randomly selected joints to verify use of dry nitrogen during brazing operations. Inspect joints for oxidation in the presence of the Mechanical Construction Manager. For each joint which shows evidence of oxidation, cut out an additional joint. If four fittings are found oxidized, rework all joints including those removed for inspection.
- E. On completion of refrigerated work, remove tools, equipment, excess materials, scrap, waste, and other debris resulting from work, and clean walk-in coolers/freezers, cases, roof areas adjacent to condensers, and refrigeration compressor house.

#### 3.15 CLEAN-UP

- A. Promptly remove all rubbish or debris resulting from the Work.
- B. During course of the Work, the area in which the Contractor is working shall be kept in an orderly, reasonably clean condition. Keep gang boxes off sales floor. Tools, supplies, etc., shall remain only as long as they are in use. Abide by site cleanliness policies of the Owners general construction compliances and all other applicable laws and regulations for the AHJ.
- C. Thoroughly clean Work furnished and installed under your Contract, ready for Owner's use.

#### 3.16 OWNER TESTING AND INSPECTION (T&I)

- A. The Owner will provide access to the Work at all times for purpose of inspection.
- B. If Specifications, Instructions, Inspection Coordinators, or laws, ordinances, rules, regulations or any public authority require a portion of the Work to be tested, approved or inspected, Contractor shall give the Owner timely notice of its readiness for inspection.
- C. In order to verify use of dry nitrogen during brazing operations as specified, the Owner's Mechanical Construction Manager may require Contractor to cut out five randomly selected joints. Joints will be inspected for oxidation. For each joint which shows evidence of oxidation and non-compliance, another joint will be cut out. If four fittings are found oxidized, it will be assumed that all joints are defective, therefore all joints will be reworked. Rework joints removed for inspection. This inspection and re-work is at the expense of the contractor.

#### 3.17 MAINTENANCE

- A. Provide a 90 day maintenance service period from the date of site observation log punch list completion or grand opening, whichever is later to include maintenance and assurance of proper operation of the entire refrigeration system. The service period shall include maintenance for primary refrigerant and routine maintenance and emergency services. Upon start-up, submit the names of local service companies authorized by the OEM for maintenance service to Mechanical Construction Manager.
- B. Response time to emergency service calls shall be within two hours. In the event the Contractor fails to respond to emergency calls or fails to perform required maintenance or repairs during the maintenance period, the Owner will have the right to have the repair or maintenance performed by another contractor. In this case, the Contractor agrees to pay the Owner the invoiced amount of the services performed plus 15 percent.
- C. If the service subcontractor discontinues or drops their service level because the Contractor has failed to make payment to the subcontractor on completed maintenance work, Owner may remove the Contractor from bidder eligibility for future new store work until such time that disputes or claims are settled.
- D. Perform inspection of installation at end of maintenance service period.
  - 1. Make necessary corrections and adjustments. Notify Owner's Mechanical Construction Manager (MCM) prior to inspection.
  - 2. Provide lubrication, leak tests of all joints, flare nuts, and tightening of strapping. Perform leak test on all fixtures and rack service points, fittings and valves.
  - 3. Change replaceable suction, liquid, and oil filters. Place suction, liquid, and oil filters in a sealable plastic bag to prevent setting off any leak detection system. Leave oil filters and dryers in motor room for inspection by Owner's Mechanical Construction Manager.
  - 4. Assure all deviations have been resolved.
- E. At the end of maintenance services period, certify in a letter to the Owner that equipment and materials installed or connected are functioning properly. Include certification that systems are free of leaks and are maintaining satisfactory temperatures at normal control adjustments.

### 3.18 CHANGES IN THE WORK

- A. Do not make changes to the SOW, perform additional work, or pay for additional work unless authorized in writing by the Owner.

### 3.19 DEDUCTIONS FOR WORK NOT CORRECTED

- A. If the Owner deems it expedient to correct work not conforming to the Contract or defective work, an equitable deduction from the Contract price will be made.

### 3.20 CORRECTION OF WORK BEFORE FINAL PAYMENT

- A. If the Owner rejects a portion of the Work due to failure to conform to the Contract, the Owner will promptly notify the Contractor of such failure.
- B. Upon receipt of such notice, replace or remedy (whichever the Owner requires) the rejected work, so as to conform to the awarded Contract.
- C. Contractor shall bear all expenses incident to correction of non-conforming work including cost of transportation, removal of non-conforming work, correction of the work, and repairs to work of other contractors necessitated by remedial work.
- D. Protect the Work from damage until final acceptance by the Owner. Damaged or defective work shall be replaced at Contractor's expense.
- E. Contractor shall be responsible for damage caused by Contractors own forces or by Contractor's subcontractors' forces.

F. Replace damaged work at no expense to the Owner per awarded contract documents.

END OF SECTION

**REFRIGERATION INSTALLATION  
HANDOVER DOCUMENT / SIGN OFF SHEET**

*All sections of this document must be completed before the installation will be accepted.*

Store No. \_\_\_\_\_ Location: \_\_\_\_\_ Store Type: \_\_\_\_\_  
City, State SC, WNM

Grand Opening Date: \_\_\_\_\_

Project Type: \_\_\_\_\_  
New SC Store/ Sam's Club, Relocation, Remodel, Capital Expenditure (CapEx)

Installing Contractor: \_\_\_\_\_  
Contractor's name and branch location, if applicable

Equipment Supplier: \_\_\_\_\_  
Hill PHOENIX, Kysor Warren, Zero Zone, Hussmann, RAE

Refrigerant: \_\_\_\_\_  
R 448a, R744, etc.

System Type: \_\_\_\_\_  
Direct Expansion (DX), Secondary CO<sub>2</sub>, Secondary Glycol

Heat Reclaim: \_\_\_\_\_  
Domestic Water, HVAC, N/A

Bldg Automation System (BAS): \_\_\_\_\_  
Novar, Danfoss, Copeland

Refrigerant Data Submitted: \_\_\_\_\_  
Date Submitted or N/A

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**APPROVAL**

The work carried out during this project is complete and the standard achieved is acceptable.

\_\_\_\_\_  
Name of Owner's Mechanical Construction Manager      Signature      Date

**Notice to OWNER'S MCM:**

By signing this form, you are confirming the following:  
The work detailed above is complete and all systems are operating as intended.  
All handover documentation has been completed and you are satisfied with its contents.  
All issues are either resolved or you are satisfied with the plan for resolution.

**REFRIGERATION INSTALLATION  
HANDOVER DOCUMENT / SIGN OFF SHEET  
SKID OR SYSTEM**

*All sections of this document must be completed before the installation will be accepted.*

Store No. \_\_\_\_\_ Location: \_\_\_\_\_ Store Type: \_\_\_\_\_  
City, State SC, WNM

\_\_\_\_\_  
Name of technician carrying out checks and completing this form Date

Type of machine room \_\_\_\_\_  
Rack, weatherpac, Secondary Glycol Skid, Secondary CO2 Skid, Trans-critical CO2 Rack

Machine room supplier \_\_\_\_\_  
Hill PHOENIX, Kysor Warren, Zero Zone, Hussmann, RAE, Other

- Are units bolted to steel? ..... yes / no
- Are all penetrations properly sealed?..... yes / no
- Do all power sockets and lights operate correctly?..... yes / no
- Do all exhaust fans operate correctly? ..... yes / no
- Are all doors hung properly and operating correctly? ..... yes / no
- Is there any damage to the room which needs repair? ..... yes / no
- Are all shields and hoods installed correctly?..... yes / no
- Are Operation and Maintenance (O and M) manuals left on site?..... yes / no
- Are drawings mounted on the walls of machine rooms? ..... yes / no
- Have liquid line filter driers, oil system driers, and suction line filter driers  
been changed after 24 hours of run time? ..... yes / no
- Is leak detection installed?..... yes / no
- Has leak detection been tested and certified functional? ..... yes / no
- Are electrical drawings mounted inside electrical panels? ..... yes / no
- Are all electrical distribution panels labeled correctly?..... yes / no
- Are all trunking lids and junction box covers in place?..... yes / no
- Have all relevant labels been fixed to major items of equipment? ..... yes / no
- Is the machine room clean and free from rubbish? ..... yes / no

*Capital Expenditure (CAPEX) and Remodel Projects*

Have all existing, redundant materials (conduit, pipework, etc.)  
been stripped out or made safe?..... yes / no

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



**REFRIGERATION INSTALLATION  
HANDOVER DOCUMENT / SIGN OFF SHEET  
(COMPLETE ONE FORM PER SYSTEM INSTALLED)**

*All sections of this document must be completed before the installation will be accepted.*

Store No. \_\_\_\_\_ Location: \_\_\_\_\_ Store Type: \_\_\_\_\_  
City, State \_\_\_\_\_ SC, WNM \_\_\_\_\_

\_\_\_\_\_  
Name of technician carrying out checks and completing this form \_\_\_\_\_ Date \_\_\_\_\_

Rack Type \_\_\_\_\_  
Parallel Recip, Rack in a Box (RIB), Modular \_\_\_\_\_

Rack Manufacturer \_\_\_\_\_

Rack Model No. \_\_\_\_\_ Rack Serial No. \_\_\_\_\_

Refrigerant Type \_\_\_\_\_ Record System Refrigerant Charge \_\_\_\_\_

Does the refrigerant type match what is called for on the legend? \_\_\_\_\_ yes / no \_\_\_\_\_

Verify the main power voltage.      L1 > GD \_\_\_\_\_      L1 > L2 \_\_\_\_\_  
   L2 > GD \_\_\_\_\_      L1 > L3 \_\_\_\_\_  
   L2 > GD \_\_\_\_\_      L1 > L3 \_\_\_\_\_

Verify the control voltage. \_\_\_\_\_

Confirm operation of power failure (PF) module and record settings.    Delay \_\_\_\_\_    Voltage \_\_\_\_\_

Are all electrical connections tight? \_\_\_\_\_ yes / no \_\_\_\_\_

Compressor Manufacturer \_\_\_\_\_

Record model number of each compressor. Verify that model numbers match legend.

Compressor 1 \_\_\_\_\_      Compressor 2 \_\_\_\_\_  
Compressor 3 \_\_\_\_\_      Compressor 4 \_\_\_\_\_  
Compressor 5 \_\_\_\_\_      Compressor 6 \_\_\_\_\_

Record running amps for each compressor.

COMP 1				COMP 2			
Loaded	L1 _____	L2 _____	L3 _____	Loaded	L1 _____	L2 _____	L3 _____
Unloaded	L1 _____	L2 _____	L3 _____	Unloaded	L1 _____	L2 _____	L3 _____
COMP 3				COMP 4			
Loaded	L1 _____	L2 _____	L3 _____	Loaded	L1 _____	L2 _____	L3 _____
Unloaded	L1 _____	L2 _____	L3 _____	Unloaded	L1 _____	L2 _____	L3 _____
COMP 5				COMP 6			
Loaded	L1 _____	L2 _____	L3 _____	Loaded	L1 _____	L2 _____	L3 _____
Unloaded	L1 _____	L2 _____	L3 _____	Unloaded	L1 _____	L2 _____	L3 _____

Allow the oil pressure switch to trip on each compressor to ensure proper operation. After oil pressure trips, wait two minutes and check crankcase heater operation. Record amp draw of each crank case heater.

C1 \_\_\_\_\_ C2 \_\_\_\_\_ C3 \_\_\_\_\_ C4 \_\_\_\_\_ C5 \_\_\_\_\_ C6 \_\_\_\_\_

Adjust and record compressor's start delay timer setting.

C1 \_\_\_\_\_ C2 \_\_\_\_\_ C3 \_\_\_\_\_ C4 \_\_\_\_\_ C5 \_\_\_\_\_ C6 \_\_\_\_\_

Adjust and record compressor's HP cut out switch setting.

C1 \_\_\_\_\_ C2 \_\_\_\_\_ C3 \_\_\_\_\_ C4 \_\_\_\_\_ C5 \_\_\_\_\_ C6 \_\_\_\_\_

---

Is BAS suction transducer calibrated? yes / no

Record the BAS rack suction pressure settings. Cut In \_\_\_\_\_ Cut Out \_\_\_\_\_

Check and record the rack suction pressure. BAS \_\_\_\_\_ Gauge \_\_\_\_\_

Check and record the suction temperature. BAS \_\_\_\_\_ Meter \_\_\_\_\_

What is the rack superheat? \_\_\_\_\_

Have all Evaporator Pressure Regulators (EPRs) been set correctly? yes / no

Note: Individual EPR settings to be recorded on case start-up documents.

---

Check and record the ambient temperature. BAS \_\_\_\_\_ Meter \_\_\_\_\_

Is BAS discharge transducer calibrated? yes / no

Check and record the discharge pressure. BAS \_\_\_\_\_ Gauge \_\_\_\_\_

Check and record the discharge temperature. BAS \_\_\_\_\_ Meter \_\_\_\_\_

Check and record the drop leg temperature. BAS \_\_\_\_\_ Meter \_\_\_\_\_

Does this rack have hot water / heat reclaim? yes / no

Record heat reclaim control settings. Reclaim t'stat \_\_\_\_\_ Electric heater t'stat \_\_\_\_\_

Note: Reclaim thermostat should be set to 140°F. Electric back up thermostats should be set to 130°F.

Check and record correct heater element voltage. \_\_\_\_\_

Record the rack high pressure BAS lockout setting. \_\_\_\_\_

---

Does this rack have ambient subcooling (surge)? yes / no

Check and record the BAS surge setpoints. Cut In \_\_\_\_\_ Cut Out \_\_\_\_\_

Check for correct operation. Is system operating OK? yes / no

Does this rack have subcooling? yes / no

Record liquid subcooling temp BAS set point. \_\_\_\_\_

Record actual liquid temperature. \_\_\_\_\_

Record EPR / EEPR setting (as applicable). \_\_\_\_\_



Record outlet pressure regulator (OPR) setting (if applicable). \_\_\_\_\_

Record bypass valve setting (if applicable). \_\_\_\_\_

Confirm correct operation. Is system operating OK? yes / no

---

Condenser Manufacturer \_\_\_\_\_

Condenser Model No. \_\_\_\_\_

Is condenser clean and free from debris? yes / no

Are condenser fan motors rotating correctly? yes / no

Does store location require condenser fins to be coated? yes / no

Does this condenser have a Variable Freq. Drive (VFD) controlling the fan motors? yes / no

Confirm correct settings and operation of VFD. yes / no

If no VFD, confirm correct condenser control by BAS. yes / no

Confirm correct settings and operation of condenser split. yes / no

Confirm correct operation of condenser drain down system. yes / no

Is inverted trap installed on inlet side of condenser pipe work? yes / no

Is test valve installed on inlet side of condenser pipe work? yes / no

Record setting of liquid hold back valve. \_\_\_\_\_

---

Is receiver level alarm device operating? yes / no

Record level of refrigerant in tank. \_\_\_\_\_%

---

Are caps for all valves installed and tightened at end of start-up? yes / no

Record setting of rack high pressure cut out switch. \_\_\_\_\_

Is sufficient oil in the oil reservoir? yes / no

Is the oil level in each compressor correct? yes / no

Is the oil clear in color and free of oxidation after minimum 24 runtime? yes / no

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**REFRIGERATION INSTALLATION  
HANDOVER DOCUMENT / SIGN OFF SHEET  
(COMPLETE ONE FORM PER SYSTEM INSTALLED)**

*All sections of this document must be completed before the installation will be accepted.*

Store No. \_\_\_\_\_ Location: \_\_\_\_\_ Store Type: \_\_\_\_\_  
City, State SC, WNM

---

Name of technician carrying out checks and completing this form \_\_\_\_\_ Date \_\_\_\_\_

All system identification labels installed? \_\_\_\_\_ yes / no

All expansion valve strainers cleaned? Check three strainers per rack. \_\_\_\_\_ yes / no

List circuit numbers of strainers checked. \_\_\_\_\_

Are condensate drains operating correctly? \_\_\_\_\_ yes / no

Are all glass doors adjusted properly? \_\_\_\_\_ yes / no

Are cases shimmed every 4 feet? \_\_\_\_\_ yes / no

Are case to case joints sealed? \_\_\_\_\_ yes / no

At bottom penetrations in cases, is foam shaved flat and sealed? \_\_\_\_\_ yes / no

---

System No. \_\_\_\_\_ Make \_\_\_\_\_

Case No. \_\_\_\_\_ Model \_\_\_\_\_

Length (feet) \_\_\_\_\_

Float Circuit? \_\_\_\_\_ yes / no

EPR Setting \_\_\_\_\_ psi Lighting Amps \_\_\_\_\_

BAS Setting Cut In \_\_\_\_\_ °F Fan Amps \_\_\_\_\_

BAS Setting Cut Out \_\_\_\_\_ °F Defrost Amps \_\_\_\_\_

Superheat Setting \_\_\_\_\_ °F Trim Heater Amps \_\_\_\_\_

Confirm that the breakers to the following circuits are labeled correctly.

Lighting \_\_\_\_\_ yes / no

Fans \_\_\_\_\_ yes / no

Defrost \_\_\_\_\_ yes / no

Trim Heaters \_\_\_\_\_ yes / no

---

System No. \_\_\_\_\_ Make \_\_\_\_\_  
Case No. \_\_\_\_\_ Model \_\_\_\_\_

Length (feet) \_\_\_\_\_

Float Circuit? \_\_\_\_\_ yes / no

EPR Setting \_\_\_\_\_ psi Lighting Amps \_\_\_\_\_

BAS Setting Cut In \_\_\_\_\_ °F Fan Amps \_\_\_\_\_

BAS Setting Cut Out \_\_\_\_\_ °F Defrost Amps \_\_\_\_\_

Superheat Setting \_\_\_\_\_ °F Trim Heater Amps \_\_\_\_\_

Confirm that the breakers to the following circuits are labeled correctly.

Lighting \_\_\_\_\_ yes / no  
Fans \_\_\_\_\_ yes / no  
Defrost \_\_\_\_\_ yes / no  
Trim Heaters \_\_\_\_\_ yes / no

---

System No. \_\_\_\_\_ Make \_\_\_\_\_  
Case No. \_\_\_\_\_ Model \_\_\_\_\_

Length (feet) \_\_\_\_\_

Float Circuit? \_\_\_\_\_ yes / no

EPR Setting \_\_\_\_\_ psi Lighting Amps \_\_\_\_\_

BAS Setting Cut In \_\_\_\_\_ °F Fan Amps \_\_\_\_\_

BAS Setting Cut Out \_\_\_\_\_ °F Defrost Amps \_\_\_\_\_

Superheat Setting \_\_\_\_\_ °F Trim Heater Amps \_\_\_\_\_

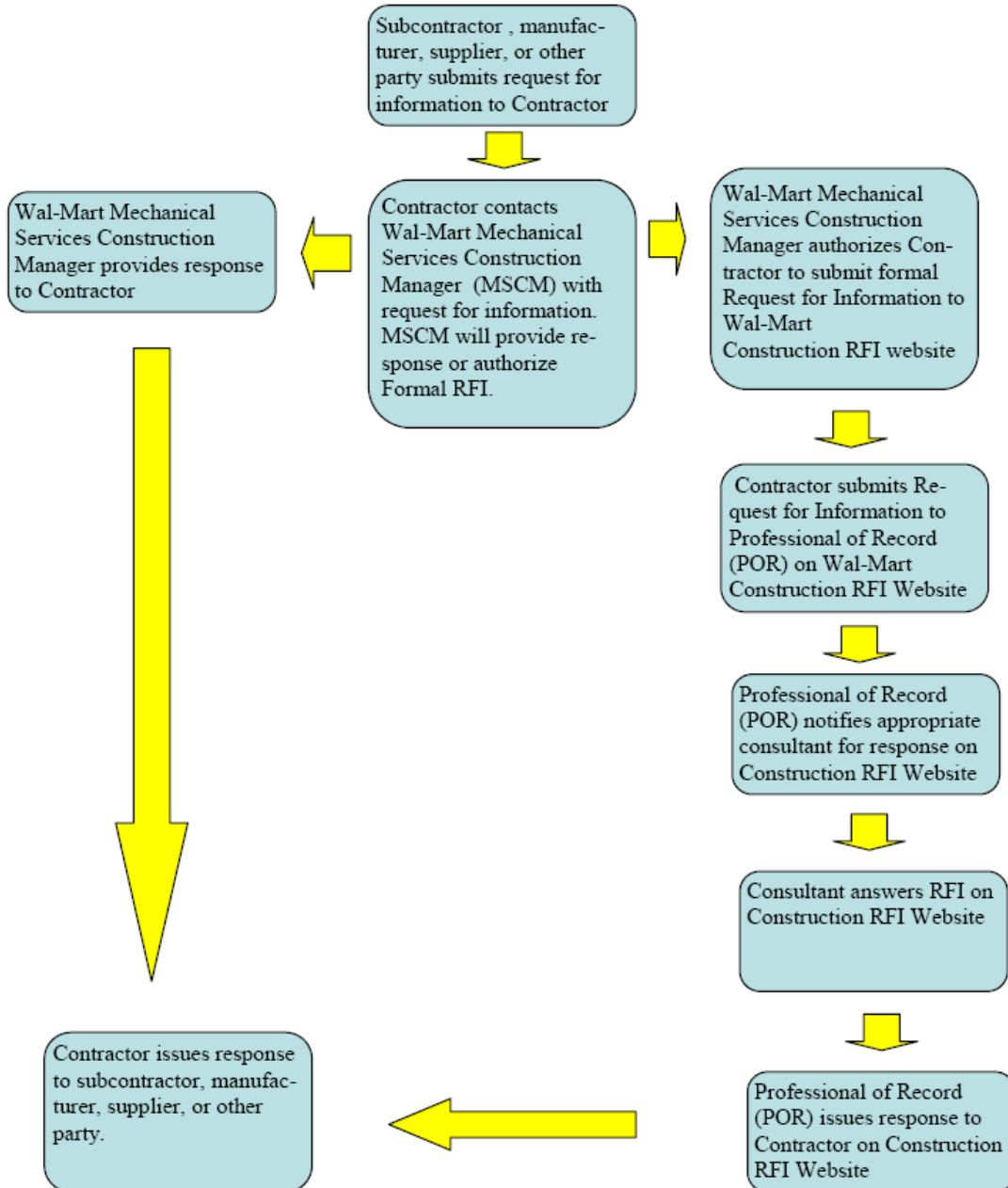
Confirm that the breakers to the following circuits are labeled correctly.

Lighting \_\_\_\_\_ yes / no  
Fans \_\_\_\_\_ yes / no  
Defrost \_\_\_\_\_ yes / no  
Trim Heaters \_\_\_\_\_ yes / no

Refrigerant Data Collection					Date:	
Store #	9894	City	Metairie	State	LA	
<b>Project Type</b>		<b>New Rack Manufacture</b>				
Other:		Other:				
Recovered refrigerant shipped to:						
Refrigerant Removed		New System(s)		New Refrigerant Type		
System	LBS	System	LBS	System Type	Model #	Serial #
Rack A		Rack A				
Rack B		Rack B				
Rack C		Rack C				
Rack D		Rack D				
Rack E		Rack E				
Rack F		Rack F				
RCU 1		RCU 1				
RCU 2		RCU 2				
RCU 3		RCU 3				
RCU 4		RCU 4				
RCU 5		RCU 5				
RCU 6		RCU 6				
RCU 7		RCU 7				
RCU 8		RCU 8				
RCU= Remote Condensing Unit						
<b>Work That Increased Full Charge</b>				<b>Notes:</b>		
System	LBS	Circuits Added				
Rack A						
Rack B						
Rack C						
Rack D						
Rack E						
Rack F						
All Completed Forms must be submitted to E-mail below:						
	<a href="mailto:MCEQUIP@walmart.com">MCEQUIP@walmart.com</a>					

Refrigerant Data Collection					Date:	
Store #	8862	City	Murray	State	UT	
<b>Project Type</b>		<b>New RCU Manufacture</b>				
Other:		Other:				
Recovered refrigerant shipped to:						
Refrigerant Removed		New System(s)		New Refrigerant Type		
System	LBS	System	LBS	System Type	Model #	Serial #
RCU 1		RCU 1				
RCU 2		RCU 2				
RCU 3		RCU 3				
RCU 4		RCU 4				
RCU 5		RCU 5				
RCU 6		RCU 6				
RCU 7		RCU 7				
RCU 8		RCU 8				
RCU= Remote Condensing Unit						
<b>Work that increased full charge</b>				<b>Notes:</b>		
System	LBS	Circuits Added				
Rack A						
Rack B						
Rack C						
Rack D						
Rack E						
Rack F						
All Completed Forms must be submitted to E-mail below:						
	-					
	<a href="mailto:MCEQUIP@walmart.com">MCEQUIP@walmart.com</a>					

**HVAC/REFRIGERATION/EMS  
REQUEST FOR INFORMATION  
PROCESS FLOW CHART  
WAL-MART STORES, SUPERCENTER, SAM'S CLUB,  
NEIGHBORHOOD MARKET**



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## SECTION 15700 - HEATING, VENTILATING, AND AIR CONDITIONING EQUIPMENT

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
1. Heating, ventilating, and air conditioning systems furnished by Owner or Contractor as specified herein and installed by Contractor.
    - a. Roof Top Air Conditioning Units.
    - b. Air Curtains.
- B. Related Requirements: The following list is intended to aid in locating products and work related to or dependent on the scope in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
1. Section 01454 - Architect-Engineer Site Observation.
  2. Section 01455 - Mechanical Equipment Testing, Adjusting, and Balancing: Test and balance.
  3. Section 15050 – Basic Mechanical Materials and Methods.
  4. Section 01600 - Product Requirements: Direct purchased products through pre-negotiated suppliers.
  5. Section 01770 - Contract Closeout.
  6. Section 07721 - Manufactured Curbs: Curbs for roof top heating, ventilating, and air conditioning equipment.
  7. Section 13810 - Building Automation System (BAS): Cable sets and conduit for remote temperature sensor, control wiring, and related components for building automation system.
  8. Appendix A – Products and Work by Owner or Separate Contractor: Manufacturers, suppliers, product information, installation (if applicable), and general procedures related to Owner furnished products.
  9. Appendix B – Testing, Inspection, and Observation by Owner.

## 1.2 DEFINITION OF TERMS

- A. Work shall mean complete installation of equipment and devices in accordance with applicable Specifications and as described in the Drawings, Application Sheets, Manufacturer's Cut Sheets and Instructions.
- B. HVAC Contractor shall mean the General Contractor's, Subcontractor that is responsible for performing the HVAC work as specified on the construction documents. HVAC Contractor shall be responsible for compliance with applicable codes, ordinances, and work permits.

## 1.3 QUALITY ASSURANCE

- A. Certifications: Each item of equipment available with capacity ratings certified by AMCA and/or ARI, shall be furnished with capacity ratings so certified.

## 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Heating, Ventilating, and Air Conditioning Equipment Furnished by Owner and Installed by Contractor: Include in Contract Amount costs incurred for receiving, storage, and labor. Contractor shall be responsible for costs arising when replacement materials must be reshipped due to loss or damage on job site after acceptance of original shipment. Immediately upon award of Contract, coordinate release of units for delivery to site with contacts specified in this Section. Provide crane service to hoist HVAC units directly from truck to roof.

## 1.5 SCHEDULING

- A. Milestone Completion Date: Complete Work of this Section on or before Delivery date specified in Appendix A, "Owner Furnished Equipment Shown on Drawings".
- B. Coordinate Contract interface Work of this Section to provide for building automation system operation and testing



in accordance with building automation system Milestone Completion date.

- C. Schedule testing and balancing in accordance Section 01455.

## 1.6 WARRANTY

- A. Owner furnished equipment shall be turned over to Owner in good working order. Prior to acceptance by Owner, equipment failures are under manufacturer's warranty. Notify equipment warranty contact specified herein for replacement or reimbursement information prior to beginning repairs. After acceptance by Owner, Contractor is not responsible for warranty repair.

## 1.7 SYSTEM START-UP

- A. The Contractor shall conduct start-up operations for equipment specified herein other than RTUs and AHUs, or as Scheduled on Drawings. Perform start-up in accordance with manufacturer's printed installation and start-up instructions. Mechanical failure, prior to acceptance by Owner, shall be repaired by Contractor through warranty agreement with manufacturer.
- B. Prior to test and balance, complete work of this section and contract interface work of Section 13810 - Building Automation Systems. Refer to Section 13810 for testing of building automation controls by building automation system installer.
- C. Schedule start-up, allowing Owner's representative to be present unless Owner directs otherwise. If start-up and testing cannot be completed due to seasonal weather conditions, perform remaining start-up at an appropriate time. Payment may be withheld until Work is complete. During start-up, operate each unit in every mode, separately and in conjunction with other units for sufficient period of time, demonstrating to Owner's satisfaction that each unit is operating properly.
- D. Record designated start-up data on forms attached at end of this Section. Retain completed form on site.
- E. Roof Top Air Conditioning Units (RTU):
  - 1. Fill out RTU Pre-Start Checklist and return to Lennox National Account Services to request a final commissioning date for the project. Commissioning should be scheduled to complete final commissioning within 4 business days of contractor completion of work.

## 1.8 REQUEST FOR INFORMATION SUBMITTAL

- A. All Requests for Information (RFIs) regarding HVAC shall follow the attached copy of the Request for Information Process Flow Chart.
- B. Refer to Specification Section 01255 for RFI Information Submittal Process.

## PART 2 - PRODUCTS

### 2.1 OWNER FURNISHED PRODUCTS

- A. Products Installed But Not Supplied Under This Section:
  - 1. Owner will furnish heating, ventilating, and air conditioning equipment as specified in Appendix A (section 15700) for installation by the Contractor.
    - a. Roof top air conditioning units.

### 2.2 EXISTING ROOF TOP AIR CONDITIONING UNITS

- A. Where required, provide smoke detectors in existing roof top units.

### 2.3 AIR CURTAINS

- A. Air curtains shall be of the model and characteristics as shown on the drawings. Air curtains shall be Contractor

furnished - Contractor installed. Units shall be by one of the following manufacturers:

1. Berner International Corp., New Castle, PA. Supplier Contact: Sales Dept. (800)245-4455.
2. Powered Aire, Inc., Greenville, PA Supplier Contact: Jay Lynn, (888) 321-2473.

B. Product Procurement:

1. Units shall be Direct Purchase Products purchased directly by the General Contractor through a Pre-Negotiated Supplier specified above in accordance with requirements specified in Section 01600.
2. Obtain equipment pricing and purchasing instructions through Pre-Negotiated Supplier Contact.
3. Send purchase orders to Pre-Negotiated Supplier contact.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

A. Install equipment per manufacturers instructions and requirements of Authority Having Jurisdiction (AHJ).

B. Air Handling, DOAS, and Roof Top Air Conditioning Units:

1. Coordination:
  - a. Coordinate installation, testing, and completion dates with Building Automation System (BAS) installer.
  - b. Coordinate installation and testing and balancing with ITBA as specified in section 01455.
2. Label units with 6 inch black permanent paint stencil. Number units as indicated on Drawings. Locate label for each unit so it can be read from the roof hatch.
3. Do not set roof top equipment on curbs until installation of roofing base flashing has been completed.
4. Label RTUs scheduled with CO2 sensors with 3 inch red permanent paint stencil. Label units "IAQ" and locate label for each unit so it can be read from the roof hatch.
5. Perform and record Pre-Start-Up data on forms included at the end of this Section and in the Issue Escalations and Communication and Closeout Documents folders in *Wrike*.
6. Order and install Walmart Asset tags as specified in Section 15050. Input data using the Asset Data Collection Application as specified in Section 15050.

C. Air Curtains.

1. Install air curtain to avoid obstructions to the air stream when the grille is directed 20 degrees to either side. Outlet nozzle shall be not more than 1 inch above the top of the door opening. If circumstances require a higher mounting, locate the unit 3/8 inch away from the wall for each inch the unit is raised above the door opening. Seal void space between air curtain and wall.

#### 3.2 FIELD QUALITY CONTROL

A. Field quality control shall be the ultimate responsibility of the Contractor in accordance with Section 01452. Field quality control testing and inspection shall be at the discretion of the Contractor as necessary to assure compliance with Contract requirements.

B. Roof Top Air Conditioning Units:

1. Testing and balancing will be performed by a Testing and Balancing Agency (ITBA) in accordance with Section 01455.
2. Full testing and balancing shall be performed only on:
  - a. New units with new or existing ductwork and/or diffusers/grilles.
  - b. Existing units with modified ductwork.
  - c. Existing units with air balance modifications.
3. Only Factory Start-up and Commissioning shall be performed on:
  - a. New units with existing drop box diffusers.

C. Air Curtains: Follow procedure outlined below to verify directional vanes are set correctly:

1. With air door operating and door in its full open position, verify there are no obstructions to the air flow.
2. Determine the air stream split location by holding a cloth approximately 12 inches above the floor. Move the cloth back and forth in doorway to verify air is being directed to both the inside and outside. The split location is determined when the cloth is vertical with minimal or no movement. The split location shall be 6 inches outside the doorway at 12 inches above the floor.

15700-3

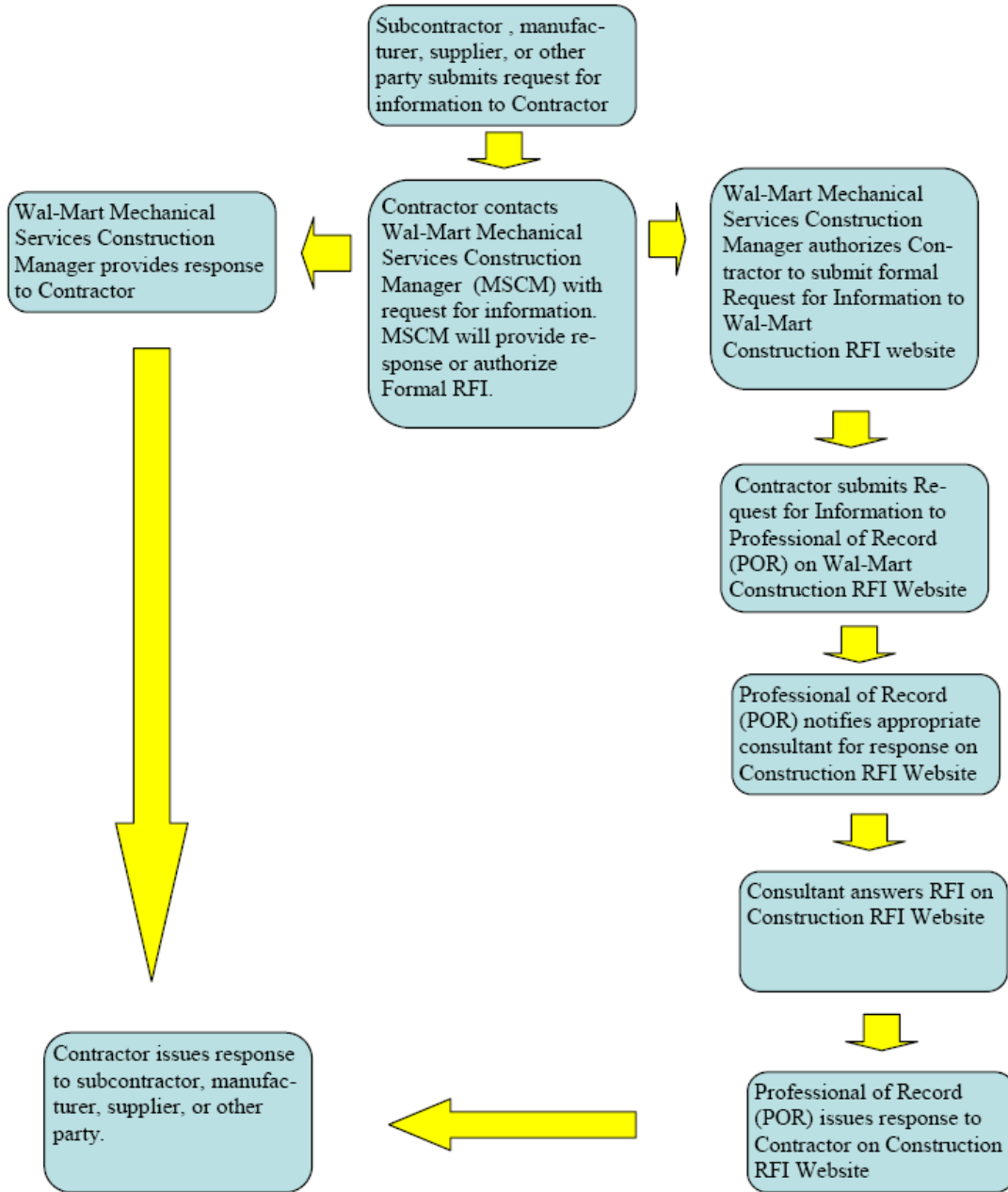
3. If split location is not correct and directional vanes need to be adjusted, disconnect power source, remove the cover housing and loosen the two vane mounting screws located on each end of the outlet nozzle. Adjust directional vanes by grasping each vane with a pair of pliers and twisting. Protect vanes with a cloth to prevent scratching with pliers. After correct adjustments have been made, retighten vane mounting screws, reassemble air curtain, and connect power supply.

### 3.3 PROTECTION

- A. Protect RTUs and AHUs and other HVAC equipment from damage, including but not limited, to paint spray and drywall dust. Replace air filters regularly to preclude damage. Damage incurred due to Contractor neglect will be repaired by manufacturer at Contractor's expense.

END OF SECTION

**HVAC/REFRIGERATION/EMS  
REQUEST FOR INFORMATION  
PROCESS FLOW CHART  
WAL-MART STORES, SUPERCENTER, SAM'S CLUB,  
NEIGHBORHOOD MARKET**



15700-6

06958 Cameron, NC

January 08, 2025

# AIR CURTAIN START-UP REPORT

Page \_\_\_\_ of \_\_\_\_

PROJECT \_\_\_\_\_ LOCATION \_\_\_\_\_

UNIT DATA	UNIT NO.*	UNIT NO.*	UNIT NO.*	UNIT NO.*	UNIT NO.*	UNIT NO.*
Manufacturer						
Area Served						
Model No.						
Serial No.						
Nameplate KW						
TEST DATA	ACTUAL	ACTUAL	ACTUAL	ACTUAL	ACTUAL	ACTUAL
Units have been cleaned (YES) (NO)						
Airstream split location has been verified and air vane adjusted						
Location of airstream split above the floor and away from door.						

\* Unit number shall correspond to number on Drawings.

START-UP DATE \_\_\_\_\_ TIME \_\_\_\_\_ READINGS BY \_\_\_\_\_

VERIFIED BY \_\_\_\_\_  
(General Contractor)

REMARKS: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

## RTU PRE-START-UP CHECKLIST - BY CONTRACTOR

<b>Store No.</b> _____	<b>Town</b> _____	<b>St</b> _____
<b>Contractor</b> _____		<b>Date</b> _____
<i>Name of technician carrying out checks and completing this form.</i>		
<b>All checklist items must be completed before the installation will be accepted.</b>		
<b>INSTRUCTIONS</b>		
<ol style="list-style-type: none"> <li>1. Contractor shall complete all items listed below in preparation for Lennox Technician Start Up. shall fill out job information and initial each section to acknowledge equipment is ready for Initial Start Up.</li> <li>2. Fax or Email to Lennox NAS at least (4) weeks prior to the requested start up date. Failure to properly complete all items before the Lennox NAS technicians arrive on site will result in additional trip charges. Return fees are paid by the G.C. based on travel requirements, not to exceed \$3,000.00.</li> <li>3. If a partial start up is being requested or if less than 3 RTUs are being added, contact Lennox.</li> </ol>		
<b>Fax To: Lennox National Account Services 214-576-3873, Attn: Services/E.Mail lennoxservices@lennoxnas.com</b> Lennox National Account Services: Voice 1-800-333-4001                      Lennox Walmart Hotline: 1-866-659-0756		
<b>Requested date for new construction start up</b> Month _____ Day _____ 20_____		
Item	RTU CHECKLIST	Response
1	Specs and installation instructions have been read and understood by contractors working on equipment.	y / n
2	All RTUs are installed per construction documents and level (where needed).	y / n
3	All RTUs are installed in the proper location and orientation per construction documents.	y / n
4	Seismic/wind clips installed and secured per manufacturer's instructions on all RTUs.	y / n
5	All RTUs are clear of damage or defect.	y / n
6	All RTUs and dropboxes labeled with correct number per construction documents in addition to Mfgs Tag.	y / n
7	Shipping screws and brackets are removed from RTUs.	y / n
8	All motor hardware, setscrews and torques tightened per installation instructions.	y / n
9	Flexible wire (power and controls) penetrations through bottom of RTU sealed per installation instructions.	y / n
10	Permanent power to the RTU convenience receptacle.	y / n
11	Permanent power of the correct voltage connected to the RTUs with connections tightened per Manufacturer. 14-10 awg 20 lb torque, 8 awg 25 lb torque, 6 awg 35 lb torque.	y / n
12	Gas lines connected to all RTUs and free of debris.	y / n
13	Proper gas pipe blocking installed in the correct locations per construction documents.	y / n
14	Proper gas regulators are installed and <b>set to correct pressure</b> per construction documents.	y / n
15	Proper gas shutoff valves installed per construction documents.	y / n
16	Dirt leg in correct location and configuration per Rooftop Gas Regulator Detail.	y / n
17	1/8" tap installed per Rooftop Gas Regulator detail for pressure testing.	y / n
18	Condensate trap and piping are properly installed and drain lines cleared?	y / n
19	Economizer outdoor hoods installed and caulked according to installation instructions.	y / n
20	Hail guards installed if applicable.	y / n
21	Equipment controls, Building Automation System (BAS), installed and functional.	y / n
22	OEM supplied air filters are in place on all RTUs.	y / n
23	Filter material (min MERV 8) properly taped over return air grills or registers if unit to used during construction.	y / n
24	Filters on all equipment used for temporary heat or cooling changed within 24 hrs. before final start-up and again at GO per mechanical schedule notes.	y / n

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25	All diffusers, grilles and ducts are installed and dampers are in the open position.	y / n
26	Facility sealed with all walls and doors installed.	y / n
27	Mechanical contractor on site during start up procedures.	y / n
28	Ladders are available for roof access.	y / n
29	Start up work will not affect other work.	y / n
30	Contractor has started units according to instructions and confirmed proper compressor rotation.	y / n
31	Start up form completed and left in door tray of unit (Last page of installation instruction).	y / n

Comments:

---



---

**Submittal**

*The information provided above confirms installation and verification is complete and the standard achieved is acceptable*

\_\_\_\_\_  
*Project Assigned General Contractor (name)*

\_\_\_\_\_  
 Signature

\_\_\_\_\_  
 Date

**Approval**

*The work carried out during this project is complete and the standard achieved is acceptable.*

\_\_\_\_\_  
*Walmart Mechanical Construction Manager (name)*

\_\_\_\_\_  
 Signature

\_\_\_\_\_  
 Date

**Notice to WM MCM:**



HVAC Verisae Data Collection						PG 1 of
Store #	9894	City	Metairie	State	LA	Date
Project Type				Other		
New RTU MFG				New AHU MFG		
New RTU Refrigerant Type				New AHU Refrigerant Type		
Units Removed			# New Units	AHU Units Model #		Units Removed (highlight removed)
Highlight all removed		RTU Units Model #				AHU 1
RTU1	RTU31			Refrigerant Charge		AHU 2
RTU2	RTU32	Refrigerant Charge		C1		AHU 3
RTU3	RTU33	C1		C2		AHU 4
RTU4	RTU34	C2		C3		AHU 5
RTU5	RTU35	C3		C4		AHU 6
RTU6	RTU36	C4		Highlight all units this model		Serial # New Unit
RTU7	RTU37	Highlight all units this model		AHU 1		
RTU8	RTU38	RTU1	RTU31	AHU 2		
RTU9	RTU39	RTU2	RTU32	AHU 3		
RTU10	RTU40	RTU3	RTU33	AHU 4		
RTU11	RTU41	RTU4	RTU34	AHU 5		
RTU12	RTU42	RTU5	RTU35	AHU 6		
RTU13	RTU43	RTU6	RTU36	AHU 7		
RTU14	RTU44	RTU7	RTU37	AHU 8		
RTU15	RTU45	RTU8	RTU38	AHU 9		
RTU16	RTU46	RTU9	RTU39	AHU 10		
RTU17	RTU47	RTU10	RTU40			
RTU18	RTU48	RTU11	RTU41			
RTU19	RTU49	RTU12	RTU42			
RTU20	RTU50	RTU13	RTU43			
RTU21	RTU51	RTU14	RTU44			
RTU22	RTU52	RTU15	RTU45			
RTU23	RTU53	RTU16	RTU46			
RTU24	RTU54	RTU17	RTU47			
RTU25	RTU55	RTU18	RTU48			
RTU26	RTU56	RTU19	RTU49			
RTU27	RTU57	RTU20	RTU50			
RTU28	RTU58	RTU21	RTU51			
RTU29	RTU59	RTU22	RTU52			
RTU30	RTU60	RTU23	RTU53			
		RTU24	RTU54			
<b>Notes:</b>						
All Completed Forms must be submitted to E-mail below:						
<a href="mailto:MCEQUIP@wal-mart.com">MCEQUIP@wal-mart.com</a>						

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		RTU25	RTU55					
		RTU26	RTU56		-			
		RTU27	RTU57					
		RTU28	RTU58					
		RTU29	RTU59					
		RTU30	RTU60					

HVAC Verisae Data Collection Cont'd						Pg of	
Store #				Date:			
Manufacture:				Manufacture:			
8	# of New Units				# of New Units		
Model # (enter # below)				Model # (enter # below)			
R- Type				R- Type			
Refrigerant Charge RTU				Refrigerant Charge RTU			
C1				C1			
C2				C2			
C3				C3			
C4				C4			
Circle all units for this model #				Circle all units for this model #			
RTU1	RTU31			RTU1	RTU31		
RTU2	RTU32			RTU2	RTU32		
RTU3	RTU33			RTU3	RTU33		
RTU4	RTU34			RTU4	RTU34		
RTU5	RTU35			RTU5	RTU35		
RTU6	RTU36			RTU6	RTU36		
RTU7	RTU37			RTU7	RTU37		
RTU8	RTU38			RTU8	RTU38		
RTU9	RTU39			RTU9	RTU39		
RTU10	RTU40			RTU10	RTU40		
RTU11	RTU41			RTU11	RTU41		
RTU12	RTU42			RTU12	RTU42		
RTU13	RTU43			RTU13	RTU43		
RTU14	RTU44			RTU14	RTU44		
RTU15	RTU45			RTU15	RTU45		
RTU16	RTU46			RTU16	RTU46		
RTU17	RTU47			RTU17	RTU47		
RTU18	RTU48			RTU18	RTU48		
RTU19	RTU49			RTU19	RTU49		
RTU20	RTU50			RTU20	RTU50		
RTU21	RTU51			RTU21	RTU51		
RTU22	RTU52			RTU22	RTU52		
RTU23	RTU53			RTU23	RTU53		
RTU24	RTU54			RTU24	RTU54		
RTU25	RTU55			RTU25	RTU55		
RTU26	RTU56			RTU26	RTU56		
RTU27	RTU57			RTU27	RTU57		

RTU28	RTU58	RTU28	RTU58	RTU28	RTU58
RTU29	RTU59	RTU29	RTU59	RTU29	RTU59
RTU30	RTU60	RTU30	RTU60	RTU30	RTU60
All Completed Forms must be submitted to E-mail below:					
	<a href="mailto:MCEQUIP@wal-mart.com">MCEQUIP@wal-mart.com</a>			-	

HVAC Verisae Data Collection Cont'd						Pg of		
Store #				Date:				
Manufacture:				Manufacture:				
# of New Units		# of New Units		# of New Units		# of New Units		
Model # (enter # below)			Model # (enter # below)			Model # (enter # below)		
R- Type			R- Type			R- Type		
Refrigerant Charge RTU			Refrigerant Charge RTU			Refrigerant Charge RTU		
C1		C1		C1		C1		
C2		C2		C2		C2		
C3		C3		C3		C3		
C4		C4		C4		C4		
Circle all units for this model #			Circle all units for this model #			Circle all units for this model #		
RTU1	RTU31	RTU1	RTU31	RTU1	RTU31	RTU1	RTU31	
RTU2	RTU32	RTU2	RTU32	RTU2	RTU32	RTU2	RTU32	
RTU3	RTU33	RTU3	RTU33	RTU3	RTU33	RTU3	RTU33	
RTU4	RTU34	RTU4	RTU34	RTU4	RTU34	RTU4	RTU34	
RTU5	RTU35	RTU5	RTU35	RTU5	RTU35	RTU5	RTU35	
RTU6	RTU36	RTU6	RTU36	RTU6	RTU36	RTU6	RTU36	
RTU7	RTU37	RTU7	RTU37	RTU7	RTU37	RTU7	RTU37	
RTU8	RTU38	RTU8	RTU38	RTU8	RTU38	RTU8	RTU38	
RTU9	RTU39	RTU9	RTU39	RTU9	RTU39	RTU9	RTU39	
RTU10	RTU40	RTU10	RTU40	RTU10	RTU40	RTU10	RTU40	
RTU11	RTU41	RTU11	RTU41	RTU11	RTU41	RTU11	RTU41	
RTU12	RTU42	RTU12	RTU42	RTU12	RTU42	RTU12	RTU42	
RTU13	RTU43	RTU13	RTU43	RTU13	RTU43	RTU13	RTU43	
RTU14	RTU44	RTU14	RTU44	RTU14	RTU44	RTU14	RTU44	
RTU15	RTU45	RTU15	RTU45	RTU15	RTU45	RTU15	RTU45	
RTU16	RTU46	RTU16	RTU46	RTU16	RTU46	RTU16	RTU46	
RTU17	RTU47	RTU17	RTU47	RTU17	RTU47	RTU17	RTU47	
RTU18	RTU48	RTU18	RTU48	RTU18	RTU48	RTU18	RTU48	
RTU19	RTU49	RTU19	RTU49	RTU19	RTU49	RTU19	RTU49	
RTU20	RTU50	RTU20	RTU50	RTU20	RTU50	RTU20	RTU50	
RTU21	RTU51	RTU21	RTU51	RTU21	RTU51	RTU21	RTU51	
RTU22	RTU52	RTU22	RTU52	RTU22	RTU52	RTU22	RTU52	
RTU23	RTU53	RTU23	RTU53	RTU23	RTU53	RTU23	RTU53	
RTU24	RTU54	RTU24	RTU54	RTU24	RTU54	RTU24	RTU54	
RTU25	RTU55	RTU25	RTU55	RTU25	RTU55	RTU25	RTU55	
RTU26	RTU56	RTU26	RTU56	RTU26	RTU56	RTU26	RTU56	
RTU27	RTU57	RTU27	RTU57	RTU27	RTU57	RTU27	RTU57	

RTU28	RTU58	RTU28	RTU58	RTU28	RTU58
RTU29	RTU59	RTU29	RTU59	RTU29	RTU59
RTU30	RTU60	RTU30	RTU60	RTU30	RTU60
All Completed Forms must be submitted to E-mail below:					
	<a href="mailto:MCEQUIP@wal-mart.com">MCEQUIP@wal-mart.com</a>			-	

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## SECTION 15800 - AIR DISTRIBUTION

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Ductwork, dampers, inlets and outlets for HVAC systems.
- B. Related Requirements: The following list is intended to aid in locating work related to or dependent on the scope of Work in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
  - 1. Section 08311 - Access Doors and Frames.
  - 2. Section 01455 - Mechanical Equipment Testing, Adjusting, and Balancing: Testing and balance of HVAC systems.
  - 3. Section 15700 - Heating, Ventilating, and Air Conditioning Equipment.

## 1.2 DEFINITION OF TERMS

- A. Work shall mean complete installation of equipment and devices in accordance with applicable Specifications and as described in the Drawings, Application Sheets, Manufacturer's Cut Sheets and Instructions.
- B. HVAC Contractor shall mean the General Contractor's, Subcontractor that is responsible for performing the HVAC work as specified on the construction documents. HVAC Contractor shall be responsible for compliance with applicable codes, ordinances, and work permits.

## 1.3 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. Air Movement and Control Association (AMCA):
  - 1. AMCA 500-D – Laboratory Methods for Testing Dampers for Rating.
  - 2. AMCA 500-L – Laboratory Methods for Testing Louvers for Rating.
- C. ASTM International (ASTM):
  - 1. ASTM A653 - Steel Sheet, Zinc-Coated (Galvanized), or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot Dip Process.
  - 2. ASTM C553 - Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications.
  - 3. ASTM C1071 - Thermal and Acoustical Insulation (Mineral Fiber, Dust Lining Material).
  - 4. ASTM C1136 - Flexible, Low Permeance Vapor Retarders for Thermal Insulation.
  - 5. ASTM C 1290 - Flexible Fibrous Glass Blanket Insulation Used to Externally Insulate HVAC Ducts.
  - 6. ASTM E84 - Surface Burning Characteristics of Building Materials.
  - 7. ASTM E 96 - Standard Test Methods for Water Vapor Transmission of Materials
  - 8. ASTM E119 - Fire Tests of Building Construction and Materials.
- D. National Fire Protection Association (NFPA):
  - 1. NFPA 90A - Installation of Air Conditioning and Ventilating Systems.
  - 2. NFPA 90B - Installation of Warm Air Heating and Air-Conditioning Systems
  - 3. NFPA 96 - Ventilation Control And Fire Protection Of Commercial Cooking Operations.
- E. Sheet Metal Air Conditioning Contractors National Association (SMACNA):
  - 1. SMACNA - HVAC Duct Construction Standards - Metal & Flexible.
- F. British Standards Institution (BSI):

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1. BS 302 - Stranded Steel Wire Ropes.

G. North American Insulation Manufacturer's Association (NAIMA):

1. AH 124 - Fibrous Glass Duct Liner Standard.

#### 1.4 QUALITY ASSURANCE

A. Comply with NFPA 90A unless otherwise indicated.

#### 1.5 SCHEDULING

A. Milestone Completion Date: Complete Work of this Section on or before Delivery date specified in Section 01600.

B. Schedule testing and balancing in accordance Section 01455 after completion of system start-up requirements.

#### 1.6 WARRANTY

A. Warrant new and modified ductwork for period of one year from date of final acceptance of job, against noise and vibration under full range of operating conditions.

### PART 2 - PRODUCTS

#### 2.1 SHEET METAL DUCTWORK

A. Sheet Metal Ductwork: Continuous hot-dip mill galvanized, minimum coating of G90, lock-forming quality steel sheets, in accordance with ASTM A653.

B. Gages: Sheet metal gage as specified in SMACNA 1035 but not less than the following:

1. Rectangular Duct: 26 gage for all sizes.

2. Round Duct: Prime grade steel sheets, by United Sheet Metal Co. Inc. or equivalent.

a. 14 inch diameter and smaller: 26 gage.

b. 15 inch diameter and larger: 24 gage.

c. 27 inch diameter through 36 inch diameter: 22 gage.

C. Round ductwork shall be spiral seam where exposed and not insulated on sales floor area and spiral or longitudinal seam in all other areas.

D. Ductwork connections for round duct may be made using SpiralMate self-sealing duct connection system by Ductmate Industries (800) 245-3188.

#### 2.2 DUCTWORK INSULATION

A. Manufacturers:

1. CertainTeed.

2. Knauf.

3. Schuller (Manville).

4. Owens/Corning.

B. Substitutions: Not permitted.

C. Duct Liner: Fibrous-Glass complying with ASTM C 1071, NFPA 90A, or NFPA 90B; and NAIMA AH124.

1. Minimum Thermal Conductivity: R-Value at 75 deg F mean temperature ..

a. Type I, Flexible: R-3.7 per inch.

b. Type II, Rigid: R=4.2 per inch.

2. Spiral Round Duct - Minimum Thermal Conductivity: R-Value at 75 deg F mean temperature.

a. Spiracoustic Plus Fiberglass Spiral Duct Liner: R-4.3 per inch.

- D. Duct Wrap: Mineral-fiber blanket insulation with factory applied FSK or vinyl jacket. Insulation shall be mineral or glass fibers bonded with a thermosetting resin, complying with ASTM C 553, Type II (for use on surfaces at temperatures up to 1700 deg. F) and ASTM C 1290. Factory-applied jackets shall conform to the following:
1. FSK Jacket: Aluminum-foil, fiberglass-reinforced scrim with kraft-paper backing; complying with ASTM C 1136, Type II.
  2. Vinyl Jacket: White vinyl with a permeance of 1.3 perms when tested according to ASTM E 96, Procedure A, and complying with NFPA 90A and NFPA 90B.

### 2.3 SELF-SEALING SPIRAL DUCTWORK SYSTEM (CONTRACTOR OPTION)

- A. General:
1. At the option of the Contractor, self-sealing ductwork system may be used in lieu of round built-up system.
  2. Meet or exceed SMACNA's Leakage Class 3 requirements with no additional sealants.
- B. Manufacturer:
1. Lindab Inc., Stamford, CT (800) 797-7476.
- C. Round Spiral Sheet Metal Ductwork System:
1. SPIROsafe as manufactured by Lindab, Inc.
  2. Duct: Galvanized, minimum coating designation of G90, lock-forming quality steel sheets, in accordance with ASTM A653.
  3. Substitutions: Not permitted.
- D. Fittings:
1. SPIROsafe as manufactured by Lindab, Inc.
  2. End gaskets EPDM rubber, factory installed, U-profile, double lipped.
- E. Control Dampers: SPIROsafe DSU as manufactured by Lindab, Inc.
- F. Supply Grilles: SPIROcomfort RGS-3 as manufactured by Lindab, Inc.

### 2.4 VOLUME CONTROL DAMPERS

- A. Manual Dampers: Provide manual volume-control dampers where indicated and of the type and model number as scheduled on the drawings. Frame and blades shall be galvanized steel. Provide ceiling doors where required in accordance with Section 08311.
1. Manufacturers: Provide dampers by one of the following:
    - a. A.E.S. Inc, East Tallassee, AL, Contact: Chad Burt (800) 786-0402.
    - b. Sisneros Brothers Mfg, Contact: Joshua Gallegos (800) 499-0106.
    - c. Ruskin Company, Kansas City, MO, (816) 761-7476.
  2. Round Dampers: Dampers shall have end bearings and center locking control handle with position indicator. Control handle shall be Durodyne KL-7R, Durodyne SRST-2R or Ventlok 639 with 2-inch extension to protect insulation.
  3. Rectangular Dampers: Dampers shall have single blade or multiple inter-locked opposed blades with shaft bearings, 3/8 inch square control shaft and center locking control handle. Control handle shall be Durodyne KL7, Durodyne SRST-2R or Ventlok 639 with 2-inch extension to protect insulation.
- B. Field fabricated dampers shall not be used.
- C. Substitutions: Not permitted unless otherwise specified.

### 2.5 FIRE DAMPERS

- A. Dampers: UL labeled, constructed and installed in accordance with NFPA 90A and UL instructions. Size dampers to provide free area equal to duct dimensions.
- B. Provide hanger design, and methods of hanging and supporting compatible with the structure.

## 2.6 AIR INLETS AND OUTLETS

- A. Grilles, registers, ceiling outlets, and ceiling inlets shall be as indicated on Drawings. Wall mounted and hard ceiling mounted air inlets and outlets shall be provided with heavy-duty sponge or soft felt gaskets.

## 2.7 HIGH TEMPERATURE SEALANT (FLUE SEALANT)

- A. Manufacturer: Provide high temp sealant as follows or equivalent:
  1. [Sil-Bond RTV 6500](#) 1-Part Silicone Sealant by Silco, Inc.

## 2.8 DUCT SEALERS

- A. Manufacturer: Provide duct sealers of one of the following:
  1. Kingco 11376 or 10526 by ITW Polymers Sealants North America (formerly ITW TACC).
  2. Ductmate PROseal.
  3. United McGill Duct-Sealer.
  4. Trans-Continental Equipment Co. (TCE) - MP Multipurpose Duct Sealant.
  5. Hardcast #601 Iron-Grip.
  6. Hardcast Aluma-Grip Tape.

- B. Substitutions: Not permitted.

## 2.9 WIRE ROPE HANGER SYSTEMS (CONTRACTOR OPTION).

- A. General: At the option of the Contractor, wire rope hanger system for ductwork may be used in lieu of conventional hangers. Hanger systems shall be approved in accordance with SMACNA HVAC Duct Construction Standards (HVAC-DCS) with a minimum load safety factor of 5:1.

- B. Manufacturer: One of the following:
  1. Ductmate Industries, Charleroi, PA, (800) 245-3188.
  2. Erico, Inc., Solon, OH (800) 462-4797.
  3. Gripple, Inc., Batavia, IL., (630) 208- 0111.

- C. Wire Rope Hanger System: One of the following:
  1. Clutcher Mechanical Hanger System by Ductmate.
  2. Hang Fast Wire Rope Hanging System by Gripple.
  3. Caddy Speed Link Universal Support System by Erico.

- D. Wire Rope:
  1. Gripple: Zinc galvanized steel wire rope. Standard lengths of 5, 10, 15, and 30 feet with a preformed loop at one end.
  2. Ductmate: Zinc coated steel aircraft quality rope, field cut to length.
  3. Erico: Galvanized steel aircraft quality wire rope. Available in 3.3, 6.6, 9.9, 16.4, and 32.8 feet lengths with factory hook at one end.

- E. Locking Device:
  1. Gripple Fastener: Zinc housing with stainless steel springs.
  2. Ductmate: Clutcher cast zinc housing with stainless steel springs.
  3. Erico: Stainless steel housing with all steel locking device.

## PART 3 - EXECUTION

### 3.1 FABRICATION

- A. Fabrication requirements apply to new and modified ductwork.
- B. Fabricate, erect, and install ductwork for heating, ventilating, and air conditioning systems per SMACNA 1035 and

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the requirements of the Authority Having Jurisdiction.

- C. Make joints air tight on supply, return, and exhaust ducts. Seal transverse and longitudinal joints with duct sealer unless otherwise noted. Seal exhaust ducts with exterior seal as required to assure positive seal. Comply with SMACNA Duct Class A.

### 3.2 DUCT INSULATION

- A. Insulate ducts in accordance with SMACNA 1035. Do not insulate exhaust ductwork unless otherwise shown or specified.
- B. Rectangular Duct: For duct liner, increase sheet metal size as needed to maintain net free area of dimensions shown on plans.
  - 1. Supply duct and air plenums: 1-1/2 inch liner.
  - 2. Return duct and air boots: 1-1/2 inch liner.
- C. Round Duct:
  - 1. Insulate the following round duct with duct wrap:
    - a. Supply and return duct in receiving areas.
    - b. Supply duct in MFC areas.
    - c. Supply and return duct above finished ceilings.
  - 2. Duct Wrap Thickness:
    - a. 2-inch (R=6.0 minimum installed value).
  - 3. Overlap facing and staple securely.
  - 4. Insulate the following round duct with interior duct liner:
    - a. Supply duct in Vestibule areas without a ceiling (exposed to public).
  - 5. Round Duct Liner Thickness: For duct liner, increase sheet metal size as needed to maintain net free area of dimensions shown on plans. Install in vestibules with exposed ductwork and where noted on drawings.
    - a. 1-inch (R=4.3 minimum installed value).

### 3.3 AIR INLETS AND OUTLETS

- A. Locations of outlets indicated on Drawings are approximate. Coordinate with other trades to make symmetrical patterns. Determine locations by established pattern of lighting fixtures or architectural reflected ceiling plan.
- B. Install fire radiation dampers and other devices at air inlets and outlets where required by codes and regulations of governing authorities. Dampers shall be UL labeled, constructed and installed in accordance with NFPA 90A and UL instructions.

### 3.4 DUCT SUPPORTS

- A. Duct support requirements apply to new and modified ductwork.
- B. Support horizontal and vertical sheet metal duct work in accordance with Schedule I or II at the end of this section.
- C. Wire Rope Hanger System (Contractor Option):
  - 1. Comply with manufacturers' load ratings and recommended installation procedures.
  - 2. Comply with SMACNA HVAC Duct Construction Standards (DCS) with the following exceptions.
    - a. Use is not restricted to the SMACNA DCS diametrical limits for single wires.
    - b. Wire rope system shall not be used for hanging risers nor for two-tier trapeze hanging method.
  - 3. Provide stress distribution saddles as required when a single wire rope is passed continuously under round and rectangular duct as required to retain duct shape
  - 4. Support wire rope from the top chord of roof joists within 3" of panel points, or from 2 x 2 x 1/4 or 1 5/8 x 1 5/8 unistrut spanning the bottom chords and overhanging a minimum of 6" on each end.
- D. Do not use fasteners which penetrate roof deck.

E. Provide sway bracing to comply with seismic requirements per local codes and Authority Having Jurisdiction.

3.5 FIRE DAMPERS

A. Install approved fire dampers in air ducts or air inlets and outlets where required by codes and regulations of governing authorities. Install access doors in ducts at all fire dampers.

3.6 PROTECTION

A. Protect work, equipment and material to prevent obstruction, damage or breakage. Close pipe openings with caps or plugs during installation. Cover and protect equipment against dirt, water, chemical or mechanical injury. At the completion of work, thoroughly clean all equipment and deliver the entire system in an unblemished condition.

3.7 TESTING

- A. Prepare systems for test and balance as specified in Section 01455.
- B. In coordination with Section 01455, make changes in pulleys, belts, ductwork, and dampers as required for correct balance as recommended by air balance and testing agency.

3.8 SCHEDULES

<b>SCHEDULE I – DUCT SUPPORT SCHEDULE</b>								
<b>MINIMUM HANGER SIZE</b>								
<b>RECTANGULAR DUCTWORK</b>								
Maximum Half of Duct Perimeter*	Pair at 10 ft Spacing		Pair at 8 ft spacing		Pair at 5 ft spacing		Pair at 4 ft spacing	
	Strap	Rod	Strap	Rod	Strap	Rod	Strap	Rod
P/2 = 30"	1" x 22 ga	10 ga	1" x 22 ga	10 ga	1" x 22 ga	12 ga	1" x 22 ga	12 ga
P/2 = 72"	1" x 18 ga	3/8"	1" x 20 ga	1/4"	1" x 22 ga	1/4"	1" x 22 ga	1/4"

\* Perimeter = Sum of Sides

<b>ROUND DUCTWORK</b>			
Diameter	Maximum Spacing	Strap	Rod
24" and less	12'	1" x 22 ga	1/4"
26"-36"	12'	1" x 20 ga	3/8"

**SCHEDULE II - WIRE ROPE HANGER SYSTEM SCHEDULE - OPTION**

**MINIMUM HANGER SIZE**

**SQUARE/RECTANGULAR DUCTWORK**

Maximum Half of Duct Perimeter*		Single Loop at 10 ft Spacing			Single Loop at 8 ft Spacing			Single Loop at 5 ft Spacing			Single Loop at 4 ft Spacing		
	Wt (lbs/ft)	Gripple	Ductmate	Erico	Gripple	Ductmate	Erico	Gripple	Ductmate	Erico	Gripple	Ductmate	Erico
P/2 = 12"	5.20	No. 2	No. 10	SLD2L	No. 2	No. 10	SLD2L	No. 2	No. 10	SLD2L	No. 1	No. 10	SLD2L
P/2 = 16"	7.09	No. 2	No. 10	SLD2L	No. 2	No. 10	SLD2L	No. 2	No. 10	SLD2L	No. 2	No. 10	SLD2L
P/2 = 24"	10.62	No. 3	No. 10	SLD3L	No. 2	No. 10	SLD2L	No. 2	No. 10	SLD2L	No. 2	No. 10	SLD2L
P/2 = 32"	14.16	No. 3	No. 20	SLD3L	No. 3	No. 10	SLD3L	No. 2	No. 10	SLD2L	No. 2	No. 10	SLD2L
P/2 = 36"	15.94	No. 3	No. 20	SLD3L	No. 3	No. 20	SLD3L	No. 2	No. 10	SLD2L	No. 2	No. 10	SLD2L
P/2 = 48"	21.25	No. 4	No. 20	-	No. 3	No. 20	SLD3L	No. 3	No. 10	SLD3L	No. 2	No. 10	SLD2L
P/2 = 56"	24.78	No. 4	No. 20	-	No. 4	No. 20	SLD3L	No. 3	No. 10	SLD3L	No. 2	No. 10	SLD2L
P/2 = 60"	26.56	No. 4	No. 30	-	No. 4	No. 20	-	No. 3	No. 20	SLD3L	No. 3	No. 10	SLD3L
P/2 = 108"	47.81	No. 4	No. 30	-	No. 4	No. 30	-	No. 4	No. 20	-	No. 3	No. 20	SLD3L

Maximum Half of Duct Perimeter*		Pair at 10 ft Spacing			Pair at 8 ft Spacing			Pair at 5 ft Spacing			Pair at 4 ft Spacing		
	Wt (lbs/ft)	Gripple	Ductmate	Erico	Gripple	Ductmate	Erico	Gripple	Ductmate	Erico	Gripple	Ductmate	Erico
P/2 = 12"	5.20	No. 2	No. 10	SLD2L	No. 1	No. 10	SLD2L	No. 1	No. 10	SLD2L	No. 1	No. 10	SLD2L
P/2 = 16"	7.09	No. 2	No. 10	SLD2L	No. 2	No. 10	SLD2L	No. 1	No. 10	SLD2L	No. 1	No. 10	SLD2L
P/2 = 20"	8.84	No. 2	No. 10	SLD2L	No. 2	No. 10	SLD2L	No. 2	No. 10	SLD2L	No. 1	No. 10	SLD2L
P/2 = 28"	12.40	No. 2	No. 10	SLD2L	No. 2	No. 10	SLD2L	No. 2	No. 10	SLD2L	No. 2	No. 10	SLD2L
P/2 = 48"	21.25	No. 3	No. 10	SLD3L	No. 2	No. 10	SLD2L	No. 2	No. 10	SLD2L	No. 2	No. 10	SLD2L
P/2 = 60"	26.56	No. 3	No. 20	SLD3L	No. 3	No. 10	SLD3L	No. 2	No. 10	SLD2L	No. 2	No. 10	SLD2L
P/2 = 108"	47.81	No. 4	No. 20	-	No. 3	No. 20	SLD3L	No. 3	No. 10	SLD3L	No. 2	No. 10	SLD2L

**ROUND DUCTWORK**

Maximum Diameter		Single Loop at 10 ft Spacing			Single Loop at 8 ft Spacing			Single Loop at 5 ft Spacing		
	Wt (lbs/ft)	Gripple	Ductmate	Erico	Gripple	Ductmate	Erico	Gripple	Ductmate	Erico
8"	6.7	No. 2	No. 10	SLD2L	No. 2	No. 10	SLD2L	No. 2	No. 10	SLD2L
14"	11.7	No. 3	No. 10	SLD3L	No. 2	No. 10	SLD2L	No. 2	No. 10	SLD2L
16"	13.4	No. 3	No. 20	SLD3L	No. 3	No. 10	SLD3L	No. 2	No. 10	SLD2L
20"	16.7	No. 3	No. 20	SLD3L	No. 3	No. 20	SLD3L	No. 2	No. 10	SLD2L
26"	21.7	No. 4	No. 20	-	No. 3	No. 20	SLD3L	No. 3	No. 10	SLD3L
32"	26.7	No. 4	No. 20	-	No. 4	No. 20	-	No. 3	No. 20	SLD3L

Maximum Diameter		Pair at 10 ft Spacing			Pair at 8 ft Spacing			Pair at 5 ft Spacing		
	Wt (lbs/ft)	Gripple	Ductmate	Erico	Gripple	Ductmate	Erico	Gripple	Ductmate	Erico
20"	16.7	No. 2	No. 10	SLD2L	No. 2	No. 10	SLD2L	No. 2	No. 10	SLD2L
26"	21.7	No. 3	No. 10	SLD3L	No. 2	No. 10	SLD2L	No. 2	No. 10	SLD2L
32"	26.7	No. 3	No. 20	SLD3L	No. 3	No. 10	SLD3L	No. 2	No. 10	SLD2L
36"	30.0	No. 3	No. 20	SLD3L	No. 3	No. 10	SLD3L	No. 2	No. 10	SLD2L

**NOTES:**

- Schedule is based on 16 gauge maximum ductwork.
- Hanger sizes are based on vertical hanging only. Refer to manufacturer's data for load limits of hangers at angles other than vertical.
- Wire diameters are based on the following sizes:

Gripple	Ductmate	Erico
Size No. 1 = 3/64"	No. 10 = 5/64"	SLD2L = 0.079" = 5/64"
Size No. 2 = 5/64"	No. 20 = 1/8"	SLD3L = 0.118" ~ 1/8"
Size No. 3 = 1/8"	No. 30 = 3/16"	
Size No. 4 = 3/16"		

- The locking device numbers corresponds to the wire numbers for all three manufacturers

END OF SECTION

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## SECTION 16050 (26 0500) - BASIC ELECTRICAL MATERIALS AND METHODS

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Electrical Identification.
  - 2. Hangers and Supports.
  - 3. Conduit Sleeves.
  - 4. Grounding and Bonding.
  
- B. Related Requirements: The following list is intended to aid in locating products and work related to or dependent on the scope in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
  - 1. Section 09900 - Paints and Coatings: Field painting of hangers and supports.
  - 2. Section 13810 – Building Automation System (BAS).
  - 3. Section 16100 - Wiring Methods.
  - 4. Section 16405 - Electrical Distribution Centers.
  - 5. Section 16500 – Lighting.
  - 6. Section 16700 – Communication.
  - 7. Appendix B – Testing, Inspection, and Observation by Owner: Procedures for inspection, testing, and documentation by Owner furnished testing laboratory.
    - a. Owner’s Independent Power Systems Study Engineer’s (PSSE) arc flash risk assessment at completion of electrical work.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
  
- B. National Fire Protection Association (NFPA).
  - 1. NFPA 70E – Standard for Electrical Safety in the Workplace.

## 1.3 QUALITY ASSURANCE

- A. Owner’s Independent Power Systems Study Engineer: The Power Systems Study Engineer (PSSE) is a consultant hired by and contracted by the Owner for the purpose of maintaining electrical living documents and ensuring compliance of equipment in accordance with NFPA 70E. Testing and inspection by the PSSE is specified in Appendix B (Section 16050).
  
- B. PSSE will perform testing and inspection site visits at no cost to the Contractor as specified in Appendix B (Section 16050).

## 1.4 SEQUENCING AND SCHEDULING

- A. Site Visit by Owner’s Independent Power Systems Study Engineer: Contact PSSE a minimum two weeks prior to completion of electrical work to schedule a site visit by PSSE.
  - 1. Coordinate with PSSE for PSSE’s site visit to occur prior to electrical work completion.
  - 2. Require electrical contractor’s attendance.
  - 3. PSSE’s testing and inspection site visit will include but may not be limited to the following:
    - a. Panel directory accuracy verification.
    - b. Breaker settings verification.
    - c. Deviation Log establishment and maintenance.
    - d. Final arc flash label application.

16050-1



- B. PSSE assigned to project is as follows:
1. Company Name:
  2. Point of Contact Name:
  3. Telephone(s):
  4. Contact email address(es):

## PART 2 - PRODUCTS

### 2.1 ELECTRICAL IDENTIFICATION (Non EDC Items)

- A. Nameplates: Provide laminated plastic nameplates with 3/4 inch minimum contrasting-color engraved letters.

### 2.2 HANGERS AND SUPPORTS

A. Manufacturers:

1. [Atkore](#) (formerly Unistrut), Harvey, IL, (800) 882-5543 or (708) 339-1610.
2. Nvent (corporate owner of Erico/Caddy brands), (800) 753-9221.
3. [Minerallac Company](#), Hampshire, IL, (800) 927-3293.

- B. Conduit and Equipment Supports: Hangers shall be Series P3000 or P3300 channels by Atkore/Unistrut depending on load and span involved. Use Pipe Hangers by Minerallac, or Caddy Clips by Erico only where impractical to install Atkore/Unistrut Hangers.

- C. Attach hangers and supports to structure overhead by methods approved at job site. Do not use fasteners which penetrate the roof deck.

### 2.3 CONDUIT SLEEVES

A. Sleeves:

1. Below grade: Galvanized, black steel, or schedule 40 PVC pipe.
2. Above grade: Electrical Metallic Tubing (EMT).

### 2.4 GROUNDING AND BONDING

- A. Insulated Grounding Bushing: Steel with feed-thru lugs.

- B. Insulated Equipment Ground Wire: Copper.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install specified materials in accordance with manufacturer's recommendations and as indicated on Drawings.

- B. Cutting and Patching: Where cutting is required through walls, floors, or ceilings, make openings no larger than required and repair affected surfaces to match adjacent surfaces.

- C. Nameplates: Bolt or pop-rivet nameplates to equipment. Clearly identify equipment or equipment served, such as "BALER", "COMPACTOR," etc. Install nameplates for each safety switch, contactor, time switch, pushbutton and other similar equipment.

- D. Electrical Equipment Supports: Support electrical equipment with hangers and supports specified above or in another approved manner where details are not indicated.

- E. Sleeves:

1. Below Grade: Install where conduits pass through concrete floors as shown on drawings.
2. Above Grade: Install where conduits pass through outside walls as shown on drawings. Caulk sleeves with sealant as specified in Section 07900.

F. Fastening and Anchoring: Fasten conduit straps, disconnect switches, panelboards, and other equipment secured to walls and slabs with cadmium plated screws or bolts and lead cinch anchors or expansion bolts and install in holes drilled with proper size masonry drill. Properly size anchors in accordance with manufacturer's recommendations for load to be supported.

G. Torque all conductor connection terminations including those in EDC to manufacturer's recommended values. Inspect panelboards for physical damage, proper alignment, anchorage, and grounding. Check proper installation and tightness of connections for circuit breakers, fusible switches, and fuses.

### 3.2 GROUNDING

A. General: Ground all metallic conduits, supports, cabinets, equipment, system neutrals, metal building structures, and other items required to be grounded in accordance with the NEC and other applicable codes and as indicated on drawings.

B. Equipment Grounding:

1. Make conduits electrically continuous using proper fittings, connections, grounding bushings, etc.
2. Where Galvanized Rigid Metal Conduit (GRC) penetrates the grade outdoors or penetrates the slab, install insulating grounding bushings.
3. Install an insulated equipment ground wire as shown on drawings.

C. Metal Underground Cold Water Pipe: Connect to electrical system if available and permitted by local codes. Install jumpers around water meters, valves, or other devices which might cause an interruption of continuity during service.

D. Concrete Encased Electrodes: Where indicated on the Drawings, furnish and install electrodes, jumpers, and approved fittings in accordance with Grounding Electrode Detail .

E. Ground Rods: If ground rods are required, install two 5/8 inch minimum diameter Copperweld rods driven vertically not less than 12 feet apart and each with 8 feet of length in contact with the soil.

### 3.3 TESTING

A. Upon completion of installation, perform continuity tests on power and equipment branch circuit conductors. Inspect wire and cable for physical damage. Verify proper phasing connections.

B. Measure ground resistance from system neutral connection at service entrance to convenient ground point on building water pipe using suitable ground testing equipment.

C. Test receptacles with circuit tester to ensure proper polarity, grounding, and continuity of circuits.

D. Load test GFCI receptacles.

### 3.4 OWNER TESTING AND INSPECTION (T&I)

A. Owner's Engineer of Record and Power Systems Study Engineers (PSSE) will perform testing and inspection (T & I) of part or all of the scope of this Section as specified in Appendix B (Section 16050).

END OF SECTION

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SECTION 16080 – PROTECTIVE DEVICE SETTINGS REPORT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Contents of Protective Device Settings Report.

B. Related Requirements: The following list is intended to aid in locating products and work related to or dependent on the scope in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.

1. Section 16050 - Basic Electrical Materials And Methods.
2. Section 16402 – Low Voltage Service And Distribution
3. Section 16442 – Branch Circuit, Distribution Panelboards, And Switchboards
4. Appendix A – - Products And Work By Owner Or Separate Contractor.
5. Appendix B – Testing, Inspection, and Observation by Owner.

C. PROTECTIVE DEVICE SETTINGS REPORT

Project: 6958_NC					
Scenario: UTILITY 2025 - MAX					
WALMART #6958					
WM SUPERCENTER					
CAMERON, NC					
157822					
UTILITY 2022					
LV Breakers					
Name/Type	Fed From	Description	Frame/Sensor/Plug	Settings	SC Ratings(kA)
CBR-AHU1	PNLBD-H4B	SQUARE D	125.0A	Fixed	Interrupting 35.0
Thermal Magnetic		Powerpact HG	125.0A		
			125.0A		
CBR-AHU2	SWBD-MSB	SQUARE D	125.0A	Fixed	Interrupting 65.0
Thermal Magnetic		Powerpact HJ	125.0A		
			125.0A		
CBR-AHU3	SWBD-MSB	SQUARE D	125.0A	Fixed	Interrupting 65.0
Thermal Magnetic		Powerpact HJ	125.0A		
			125.0A		
CBR-DTA	SWBD-MSB	SQUARE D	400.0A	Ir 400 (400A)	Interrupting 65.0
Static Trip		PowerPact L- Frame, 3.3	400.0A	tr 16	
			400.0A	Ii 10 (4000A)	
CBR-DTB	SWBD-MSB	SQUARE D	400.0A	Ir 400 (400A)	Interrupting 65.0
Static Trip		PowerPact L- Frame, 3.3	400.0A	tr 16	
			400.0A	Ii 10 (4000A)	

CBR-GEN	SWBD-MSB	SQUARE D	3000.0A	Phase	Interrupting 65.0
Static Trip		Powerpact R-Frame, 5.0 & 5.0A/P/H	1600.0A	LTPU (A);LTD 1 (1600A); 0.5	
			1600.0A	STPU 1.5 (2400A)	
				STD 0.1 (I <sup>s</sup> T On)	
				INST (RG/RK) 2 (3200A)	
				Ground	
				GFPV (500-1200A) A (500A)	
				GFD (0-0.4) 0.1 (I <sup>s</sup> T Off)	
CBR-H1A	SWBD-MSB	SQUARE D	600.0A	Ir 600 (600A)	Interrupting 65.0
Static Trip		PowerPact L-Frame, 3.3	600.0A	tr 0.5	
			600.0A	Ii 3 (1800A)	
CBR-H1B	SWBD-MSB	SQUARE D	400.0A	Ir 400 (400A)	Interrupting 65.0
Static Trip		PowerPact L-Frame, 3.3	400.0A	tr 16	
			400.0A	Ii 10 (4000A)	
CBR-H1P	SWBD-MSB	SQUARE D	250.0A	Thermal Curve (Fixed)	Interrupting 65.0
Thermal Magnetic		Powerpact, J-Frame	175.0A	INST (5-10 x Trip) 5 (875A)	
			175.0A		
CBR-H2A	SWBD-MSB	SQUARE D	400.0A	Ir 400 (400A)	Interrupting 65.0
Static Trip		PowerPact L-Frame, 3.3	400.0A	tr 1	
			400.0A	Ii 3 (1200A)	
CBR-H2B	SWBD-MSB	SQUARE D	400.0A	Ir 400 (400A)	Interrupting 65.0
Static Trip		PowerPact L-Frame, 3.3	400.0A	tr 16	
			400.0A	Ii 10 (4000A)	
CBR-H2P1	PNLBD-H2B	SQUARE D	50.0A	Fixed	Interrupting 35.0
Thermal Magnetic		EG	50.0A		
			50.0A		
CBR-H2P2	PNLBD-H2B	SQUARE D	60.0A	Fixed	Interrupting 35.0
Thermal Magnetic		EG	60.0A		
			60.0A		
CBR-H3B	SWBD-MSB	SQUARE D	125.0A	Fixed	Interrupting 65.0
Thermal Magnetic		Powerpact HJ	125.0A		
			125.0A		

CBR-H4B	SWBD-MSB	SQUARE D	800.0A	Thermal Curve	Interrupting 65.0
Thermal Magnetic		MJ w/ ET1.0 2-10x Inst.	800.0A	INST 8 (6400A)	
			800.0A	INST OR (Fixed, No User-Adjustable Setting) Fixed (8000A)	
CBR-H4C	PNLBD-H4B	SQUARE D	50.0A	Fixed	Interrupting 35.0
Thermal Magnetic		Powerpact HG	50.0A		
			50.0A		
CBR-HPU	PNLBD-H4B	SQUARE D	250.0A	Thermal Curve (Fixed)	Interrupting 65.0
Thermal Magnetic		Powerpact, J-Frame	225.0A	INST (5-10 x Trip) 5 (1125A)	
			225.0A		
CBR-L1U	PNLBD-L1D2	SQUARE D	50.0A	Fixed	Interrupting 22.0
Thermal Magnetic		QOM1-VH	50.0A		
			50.0A		
CBR-L2D1	PNLBD-L2B	SQUARE D	125.0A	Fixed	Interrupting 25.0
Thermal Magnetic		QD	125.0A		
			125.0A		
CBR-L2D2	PNLBD-L2B	SQUARE D	125.0A	Fixed	Interrupting 25.0
Thermal Magnetic		QD	125.0A		
			125.0A		
CBR-L2U	PNLBD-L1D2	SQUARE D	50.0A	Fixed	Interrupting 22.0
Thermal Magnetic		QOM1-VH	50.0A		
			50.0A		
CBR-L4D1	PNLBD-L4B	SQUARE D	400.0A	Thermal Curve	Interrupting 42.0
Thermal Magnetic		LA	300.0A	INST 4 (2628A)	
			300.0A		
CBR-L4D2	PNLBD-L4B	SQUARE D	150.0A	Fixed	Interrupting 25.0
Thermal Magnetic		QD	150.0A		
			150.0A		
CBR-L4P1	PNLBD-L4B	SQUARE D	100.0A	Fixed	Interrupting 25.0
Thermal Magnetic		QD	100.0A		
			100.0A		
CBR-L4P2	PNLBD-L4B	SQUARE D	100.0A	Fixed	Interrupting 25.0
Thermal Magnetic		QD	100.0A		
			100.0A		
CBR-L4P3	PNLBD-L4B	SQUARE D	150.0A	Fixed	Interrupting 25.0
Thermal Magnetic		QD	150.0A		
			150.0A		

CBR-L4P4	PNLBD-L4B	SQUARE D	100.0A	Fixed	Interrupting 25.0
Thermal Magnetic		QD	100.0A		
			100.0A		
CBR-L4R1	PNLBD-L4B	SQUARE D	100.0A	Fixed	Interrupting 25.0
Thermal Magnetic		QD	100.0A		
			100.0A		
CBR-L4R2	PNLBD-L4B	SQUARE D	150.0A	Fixed	Interrupting 25.0
Thermal Magnetic		QD	150.0A		
			150.0A		
CBR-LFS	CBR-LFS ENCL	SQUARE D	250.0A	Thermal Curve	Interrupting 25.0
Thermal Magnetic		J-Frame, Powerpact	225.0A	INST (5-10 x Trip) Low (1125A)	
			225.0A		
CBR-LGC	PNLBD-L2B	SQUARE D	60.0A	Fixed	Interrupting 25.0
Thermal Magnetic		FA	60.0A		
			60.0A		
CBR-LMC1	PNLBD-L2B	SQUARE D	100.0A	Fixed	Interrupting 25.0
Thermal Magnetic		QD	100.0A		
			100.0A		
CBR-LRX	PNLBD-L2B	SQUARE D	80.0A	Fixed	Interrupting 25.0
Thermal Magnetic		QD	80.0A		
			80.0A		
CBR-LTS1	PNLBD-L2B	SQUARE D	100.0A	Fixed	Interrupting 25.0
Thermal Magnetic		QD	100.0A		
			100.0A		
CBR-LTS2	PNLBD-L2B	SQUARE D	100.0A	Fixed	Interrupting 25.0
Thermal Magnetic		QD	100.0A		
			100.0A		
CBR-LVC	PNLBD-L2B	SQUARE D	60.0A	Fixed	Interrupting 25.0
Thermal Magnetic		FA	60.0A		
			60.0A		
CBR-T1D	PNLBD-H1B	SQUARE D	250.0A	Thermal Curve (Fixed)	Interrupting 65.0
Thermal Magnetic		Powerpact, J- Frame	225.0A	INST (5-10 x Trip) 10 (2250A)	
			225.0A		
CBR-T2D	PNLBD-H2B	SQUARE D	250.0A	Thermal Curve	Interrupting 35.0
Thermal Magnetic		J-Frame, Powerpact	225.0A	INST (5-10 x Trip) High (2250A)	
			225.0A		

CBR-T3D	PNLBD-H3B	SQUARE D	70.0A	Fixed	Interrupting 18.0
Thermal Magnetic		ED	70.0A		
			70.0A		
CBR-T4D	PNLBD-H4B	SQUARE D	400.0A	Thermal Curve	Interrupting 35.0
Thermal Magnetic		LH	350.0A	INST HI (3500A)	
			350.0A		
CBR-TCHA	PNLBD-DTA MAIN	EATON/CUTLER- HAMMER	15.0A	Thermal Curve (Fixed)	Interrupting 25.0
Thermal Magnetic		EGE, 3-4 Poles	15.0A	Magnetic (Fixed) Fixed (510A)	
			15.0A		
CBR-TCHB	PNLBD-DTB MAIN	EATON/CUTLER- HAMMER	15.0A	Thermal Curve (Fixed)	Interrupting 25.0
Thermal Magnetic		EGE, 3-4 Poles	15.0A	Magnetic (Fixed) Fixed (510A)	
			15.0A		
CBR-TFS	PNLBD-H4B	SQUARE D	150.0A	Fixed	Interrupting 35.0
Thermal Magnetic		Powerpact HG	150.0A		
			150.0A		
CBR-TPU	PNLBD-HPU	SQUARE D	125.0A	Fixed	Interrupting 18.0
Thermal Magnetic		ED	125.0A		
			125.0A		
MCB-AHU1	AHU1	EATON/CUTLER- HAMMER	125.0A	Thermal Curve (Fixed)	Interrupting 18.0
Thermal Magnetic		EGB, 3-4 Poles	125.0A	Magnetic (Fixed) Fixed (1312.5A)	
			125.0A		
MCB-AHU2	AHU2	EATON/CUTLER- HAMMER	125.0A	Thermal Curve (Fixed)	Interrupting 18.0
Thermal Magnetic		EGB, 3-4 Poles	125.0A	Magnetic (Fixed) Fixed (1312.5A)	
			125.0A		
MCB-AHU3	AHU3	EATON/CUTLER- HAMMER	125.0A	Thermal Curve (Fixed)	Interrupting 18.0
Thermal Magnetic		EGB, 3-4 Poles	125.0A	Magnetic (Fixed) Fixed (1312.5A)	
			125.0A		
MCB-DTA SP	PNLBD-DTA SP	GE	25.0A	Fixed	Interrupting 100.0
Thermal Magnetic		TEYL, 2 & 3 pole	25.0A		



			25.0A		
MCB-DTB SP	PNLBD-DTB SP	GE	25.0A	Fixed	Interrupting 100.0
Thermal Magnetic		TEYL, 2 & 3 pole	25.0A		
			25.0A		
MCB-L1D1	PNLBD-L1D1-1	SQUARE D	400.0A	Thermal Curve	Interrupting 42.0
Thermal Magnetic		LA	300.0A	INST LO (1500A)	
			300.0A		
MCB-L1D2	PNLBD-L1D2	SQUARE D	400.0A	Thermal Curve	Interrupting 42.0
Thermal Magnetic		LA	300.0A	INST LO (1500A)	
			300.0A		
MCB-L2B	PNLBD-L2B	SQUARE D	800.0A	Thermal Curve	Interrupting 65.0
Thermal Magnetic		MG w/ ET1.0, 2- 8x Inst.	500.0A	INST 2 (1000A)	
			500.0A		
MCB-L3D	PNLBD-L3D	SQUARE D	150.0A	Fixed	Interrupting 10.0
Thermal Magnetic		QB	150.0A		
			150.0A		
MCB-L4B	PNLBD-L4B	SQUARE D	800.0A	Thermal Curve	Interrupting 65.0
Thermal Magnetic		MG w/ ET1.0, 2- 8x Inst.	800.0A	INST 2 (1600A)	
			800.0A		
MCB-LPU	PNLBD-LPU	SQUARE D	225.0A	Fixed	Interrupting 10.0
Thermal Magnetic		QB	225.0A		
			225.0A		
MCB-MSB	SWBD-MSB	SQUARE D	3000.0A	Phase	Interrupting 100.0
Static Trip		Masterpact NW N, 5.0 & 6.0 A/P/H	3000.0A	LTPU (A) 1 (3000A)	
			3000.0A	LTD 2	
				STPU 3 (9000A)	
				STD 0.1 (I <sup>s</sup> T On)	
				INST OFF	
				INST OR Fixed (40000A)	
				Ground	
				GFPV (500- 1200A) J (1200A)	
				GFD (0-0.4) 0.4 (I <sup>s</sup> T Off)	
LV Fuses					
Name/Type	Fed From	Description	Cartridge/Trip	SC Ratings(kA)	
FS-DTA	FS-DTA ENCL	LITTELFUSE	400.0A	Interrupting 200.0	
		JTD, 600V Class J	400.0A		

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FS-DTB	FS-DTB ENCL	LITTELFUSE	400.0A	Interrupting 200.0	
		JTD, 600V Class J	400.0A		

D.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION

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## SECTION 16100 - WIRING METHODS

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
1. Wire and Cable.
  2. Conduit
  3. Outlet boxes and Conduit Fittings.
  4. Wiring Devices.
  5. Wire Connectors.
  6. Fire Alarm/Security Alarm System Rough-In
- B. Related Requirements: The following list is intended to aid in locating work related to or dependent on the scope of Work in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
1. Section 13810 - Building Automation System (BAS)
  2. Section 16050 - Basic Electrical Materials and Methods: Hangers and Supports
  3. Section 16500 – Lighting
  4. Section 16700 – Communication
  5. Appendix A – Products and Work by Owner or Separate Contractor: Manufacturers, suppliers, performance, and general procedures related to Owner furnished products.

## 1.2 REFERENCES

- A. National Fire Protection Association (NFPA):
1. NFPA 70 - National Electrical Code (NEC).
- B. American Society for Testing Material (ASTM)
1. ASTM D698 - Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft
  2. ASTM D1557 - Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-bf/ft3)
- C. National Electrical Manufacturers Association (NEMA):
1. NEMA VE 1 – Metal Cable Tray Systems
- D. Underwriters Laboratories (UL)
1. UL 1569 - Metal Clad Cables

## 1.3 QUALITY ASSURANCE

- A. Final Power Plan Review Meeting:
1. A Final Power Plan Review Meeting shall be held on-site to review the Final Power Plan and scheduling requirements. The mandatory attendees shall be the Construction Manager, General Contractor, Electrical Contractor, Security Services Representative, CCTV Representative, and Store Planning Field Manager. The meeting shall be scheduled by the General Contractor approximately 14 days after receipt of Final Power Plan Drawings. At least ten days advance notification shall be given to all attendees.
  2. The purpose of the meeting will be to review the Final Power Plan requirements and to schedule completion dates for various critical components of the Final Power Plan.
  3. The Construction Manager will review the PCOB and EWA process at this meeting, as it applies to the Final Power Plan requirements.

## 1.4 DELIVERY, STORAGE AND HANDLING

- A. Receive, store and handle products in accordance with the requirements of Appendix A – Products and Work by Owner or Separate Contractor.
- B. Arrange with Owner for delivery of Owner furnished materials at such stage of construction as will expedite the work. Products will be supplied to the job site complete and ready for installation. Allow minimum of four weeks for delivery.
- C. Provide proper facilities for handling and storage of Owner furnished materials to prevent damage. Keep materials dry and fully protected from weather.
- D. Upon receipt of shipment of Owner furnished materials, check contents of shipment against bill of material furnished by vendor. Report any shortages or damage to the vendor immediately so that replacements can be ordered and/or freight claims can be filed. Note damage on Bill of Lading in order to substantiate freight claims.
- E. All deliveries shall be staged and scheduled to correspond to construction schedule and to minimize on-site storage.
- F. Provide proper facilities for handling and storage of all materials to prevent damage. Keep materials dry and fully protected from weather

## PART 2 - PRODUCTS

### 2.1 OWNER FURNISHED PRODUCTS

- A. Owner will furnish and install fire and security alarm system as specified in Appendix A Section 16100.
  - 1. Contractor shall provide rough-in as specified herein.

### 2.2 WIRE AND CABLE

- A. Electrical Components and Devices: Listed and labeled as defined in NFPA 70, Article 100, by a nationally recognized testing agency and marked for use.
- B. Wire and cable shall bear UL label and shall conform to standards established for such materials by nationally recognized agencies.
- C. Provide code gauge, soft annealed copper wire, not less than 98 percent conductivity and of 600 volt class.
- D. Conductors:
  - 1. Insulation type shall be one of the following:
    - a. THHN
    - b. THWN
    - c. XHHW
    - d. XHHW-2
  - 2. Type:
    - a. #10 and smaller – stranded or solid.
    - b. #8 and larger - stranded
- E. Interlocked Armor Metal Clad (MC) Cable: Contractor's option as allowed by authorities having jurisdiction. MC cable shall have the following characteristics:
  - 1. Aluminum MC-Lite or Standard MC.
  - 2. Minimum size conductor, #12 AWG copper, including green insulated equipment ground, sized in accordance with the NEC.
  - 3. Overall moisture resistant tape.
  - 4. Galvanized steel or aluminum interlocked cladding.
  - 5. Manufactured in accordance with UL 1569.

- F. Wire smaller than #12 AWG not permitted unless otherwise noted. #14 AWG, type MTW or TFF permitted for signal and pilot control circuits unless otherwise noted.
- G. Color code:

SYSTEM VOLTAGE	NEUTRAL COLOR	PHASE	GROUND	ISOLATED GROUND
208/120V	white	A-black B-red C-blue	green	green W/ yellow tracer
240/120V	white	A-black B-red	green	green W/ yellow tracer
480/277V	lt. gray or white with colored stripe other than yellow	A-brown B-orange C-yellow	green	green W/ yellow tracer

- H. Color code #6 AWG and smaller phase and neutral conductors by continuous outer covering. Conductors #4 AWG and larger may be color coded by tape. Tape shall have minimum of two complete wraps around conductor at 6 inches from terminations, splices, and junction points.
- I. Identify circuit numbers with synthetic cloth or plastic labels at splice and junction points.

2.3 CONDUIT

- A. Conduit types shall be as follows and shall bear UL or ETL label:
  1. Galvanized Rigid Metal Conduit (GRC): Hot-dip galvanized.
  2. Intermediate Metal Conduit (IMC): Hot-dip galvanized.
  3. Electrical Metallic Tubing (EMT): Hot-dip galvanized.
  4. Schedule 40 heavy-wall PVC for all underground conduit runs.
  5. Flexible Metal Conduit: Zinc-coated steel or Aluminum.
  6. Liquid Tight Flexible Steel Conduit with PVC jacket.
  7. MC Cable: Steel or Aluminum Cladding.
- B. Conduit Sizes: Size conduit in accordance with NEC unless noted otherwise on Drawings, but not less than the following:
  1. Alarm and Data Systems: 3/4 inch.
  2. Flexible Metal Conduit: For connection of recessed light fixtures in suspended ceilings, 3/8 inch. For connection of other equipment subject to vibration: 1/2 inch.
  3. Underground Conduit in Parking Lot: 1 inch.
  4. Other Uses: 1/2 inch.
- C. Contact Information:
  1. Prime Conduit MWE Inc. 816-842-9283 or 800-678-3075
  2. Vikimatic 800-345-8454
  3. Innerduct 800-332-8114

2.4 OUTLET BOXES AND CONDUIT FITTINGS

- A. Outlet boxes and conduit fittings shall bear the label of a nationally recognized testing laboratory and be rated for environmental conditions where installed.
- B. Boxes: Comply with NEC in regard to maximum allowable number of conductors .

1. Interior Boxes: Hot-dip galvanized, 4 inches minimum octagon or square, unless otherwise noted. Provide single or multiple gang outlet boxes as required for flush installation in drywall construction. Provide masonry boxes for outlets installed flush in concrete unit masonry. Provide single surface-mounted outlet boxes for utility type boxes.
2. Exterior Wall Boxes: Provide masonry boxes for outlets installed flush in concrete unit masonry
3. Exterior In-Grade Pull Boxes:
  - a. PVC with UV-stabilized PVC cover, sealed and gasketed watertight.
  - b. Cast iron with cast iron cover, sealed and gasketed watertight, in vehicular traffic areas. Provide box and cover UL listed for use in vehicular traffic areas.
  - c. Install buried boxes with box covers flush with grade unless indicated otherwise.
4. Outlet Boxes: Suitable for supporting lighting fixtures if intended for that purpose.
5. Ceiling Fan Boxes: Rated and listed for mounting ceiling fans.

C. Conduit Fittings:

1. EMT Fittings for Dry Locations: Diecast or steel set screw type.
2. EMT Fittings For Wet or Damp Locations: Steel Compression type.
3. GRC, IMC, or EMT Box Connectors For Wet or Damp Locations: Weather-tight hubs.
4. Threadless GRC or IMC Fittings: Not permitted.
5. GRC or IMC connectors for dry locations.
6. PVC Fittings: Solvent weld type for PVC conduit.

## 2.5 WIRING DEVICES

A. See subsection L for device and cover plate finishes.

B. Branch Circuit Switches: Specification grade rated 20A 120/277V AC as follows:

Type	Hubbell	Pass & Seymour	Cooper	Leviton	Kason
Single Pole	HBL1221	PS20AC1	2221	1221-2	
3-Way	HBL1223	PS20AC3	2223	1223-2	
4-Way	HBL1224	PS20AC4	2224	1224-2	
Dimmers	Acuity Sensor Switch: SPODMRA-MWO-D-WH				
Dimmer	Lutron Sensor with 0-10V Dimming: MRF2S-8SDV010				
Occupancy Sensor	Lutron Companion Switch: PJ2-3BRL-GWH-L01				
Ceiling Occupancy Sensor	Lutron Companion Ceiling Occupancy Sensor: LRF2-OCR2B-P				
Ceiling Occupancy Sensor	Not Available	Not Available	Not Available	OSFHU-ITW	
Single Pole Occupancy Sensor (Dual Technology)	AD1277-1	Sensor Switch: WSX PDT	Not Available	OSSMT-MD-G	
Double Pole Occupancy Sensor (Dual Technology)	AD1277-2	Sensor Switch: WSX-PDT-2P	Not Available	Not Available	
Weatherproof, Low Temperature (Walk-In Coolers & Freezers)	Not Available	Not Available	Not Available	Not Available	11901A00005
Weatherproof, Double Pole, Low	Not Available	Sensor Switch WSX-2P- LT	Not Available	Not Available	

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Temperature (Refrigerated Prep Areas)					
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C. Receptacles - Straight Blade Nylon Grounding - Type Outlet Devices: Specification grade as follows:

Type	Hubbell	Pass & Seymour	Cooper	Leviton
Single Receptacle 20A 125V (5-20R)	HBL5361	5361	5361	5361
Duplex Receptacle 20A 125V (5-20R)	HBL5362	5362	5362	5362
Duplex Receptacle 20A 125V Isolated Ground (5-20R)	IG5362	IG5362	IG5362RN	5362-IG
GFCI Duplex Receptacle 20A 125V (5-20R)	GF20LA	2095	VGF20	7899
GFCI Weather Resistant Duplex Receptacle 20A 125V (5-20R)	GFTR20	2095TRWR	WRVGF20	W7899
Duplex Receptacle Tamper Resistant 20A 125V (5-20R)	Not Available	Not Available	Not Available	TBR20
Single Receptacle 15A 250V 2 pole 3 Wire Grounded (6-15R)	HBL5661I	5671-I	5661V	5661-I
Single Receptacle 20A 250V 2 pole 3 Wire Grounded (6-20R)	HBL5461I	5871I	5461	5461
Single Receptacle 30A 250V 2 pole 3 Wire Grounded (6-30R)	HBL9330	3801	5700N	5372
Single Receptacle 20A 125/250V 3 pole 4 Wire Grounded (14-20R)	HBL8410	3820	5759	Not Available
Single Receptacle 30A 125/250V 3 pole 4 Wire Grounded (14-30R)	HBL9430A	3864	5744N	278
Single Receptacle 20A 3 Phase 250V 3 pole 4 Wire Grounded (15-20R)	HBL8420	Not Available	Not Available	Not Available
Single Receptacle 30A 3 Phase 250V 3 pole 4 Wire Grounded (15-30R)	HBL8430A	5740	8430N	8430
Single Receptacle 50A 3 Phase 250V 3 pole 4 Wire Grounded (15-50R)	HBL8450A	5750	8450N	8450

D. Receptacles - Locking Nylon Grounding - Type Outlet Devices: Specification grade as follows:

Type	Hubbell	Pass & Seymour	Cooper	Leviton
Single Locking Receptacle 15A 125V (L5-15R)	HBL4710	4710	CWL515R	4710
Single Locking Receptacle 15A 125V Isolated Ground (L5-15R)	IG4710	IG4710	IGL515R	4710-IG
Duplex Locking Receptacle 15A 125V (L5-15R)	HBL4700I	4700	4700	4700
Duplex Locking Receptacle 15A 125V Isolated Ground (L5-15R)	IG4700A	IG4700	IG4700	4700-IG
Single Locking Receptacle 20A 125V (L5-20R)	HBL2310	L520-R	CWL520R	2310
Single Locking Receptacle 20A 125V Isolated Ground (L5-20R)	IG2310	IGL520-R	IGL520R	2310-IG
Single Locking Receptacle 30A 125V (L5-30R)	HBL2610	L530-R	CWL530R	2610
Single Locking Receptacle 30A 125V Isolated Ground (L5-30R)	IG2610	IGL530-R	IGL530R	2610-IG
Single Locking Receptacle 20A 250V 2 Pole 3 Wire Grounded (L6-20R)	HBL2320	L620-R	CWL620R	2320



Single Locking Receptacle 30A 250V 2 Pole 3 Wire Grounded (L6-30R)	HBL2620	L630-R	CWL630R	2620
Single Locking Receptacle 30A 250V 2 Pole 3 Wire Isolated Ground (L6-30R)	IG2620	IGL630-R	IGL630R	2620-IG
Single Locking Receptacle 20A 125/250V 3 pole 4 Wire Grounded (L14-20R)	HBL2410	L1420-R	CWL1420R	2410
Single Locking Receptacle 30A 125/250V 3 pole 4 Wire Grounded (L14-30R)	HBL2710	L1430-R	CWL1430R	2710
Single Locking Receptacle 50A 600V 2 pole 3 Wire Grounded (Non-Nema)	HBL3771	3771	3771	3771
Single Locking Receptacle 50A 125/250V 3 pole 4 Wire Grounded (Non-Nema)	CS6369	CS6369	CS6369	CS63-69

E. Connectors - Cord mounted Locking Nylon Grounding - Type to match Plugs as follows:

Type	Hubbell	Pass & Seymour	Cooper	Leviton
Locking Connector 15A 125V (L5-15R)	HBL4729C	PSL515-C	4731N	4729-C
Locking Connector 20A 125V (L5-20R)	HBL2313	L520-C	CWL520C	2313
Locking Connector 20A 3 Phase 250V 3 Pole 4 Wire Grounded (L15-20R)	HBL2423	L1520-C	CWL1520C	2423

F. Connectors - Cord mounted Corrosion Resistant Locking Nylon Grounding - Type to match Plugs as follows:

Type	Hubbell	Pass & Seymour	Cooper	Leviton
Corrosion Resistant Locking Connector 20A 125V (L5-20R)	HBL23CM13	CRL520-C	CRL520C	23CM-13
Corrosion Resistant Locking Connector 20A 125/250V 3 Pole 4 Wire Grounded (L14-20R)	HBL24CM13	CRL1420-C	CRL1420C	Not Available
Corrosion Resistant Locking Connector 20A 3 Phase 250V 3 Pole 4 Wire Grounded (L15-20R)	HBL24CM23	Not Available	CRL1520C	Not Available
Corrosion Resistant Locking Connector 30A 3 Phase 120/208V 4 Pole 5 Wire Grounded (L21-30R)	HBL28CM13	Not Available	Not Available	Not Available

G. Plugs - Cord mounted Nylon Grounding - Type to match Outlet Devices as follows:

Type	Hubbell	Pass & Seymour	Cooper	Leviton
Plug 20A 125V 2 Pole 3 Wire Grounded (5-20P)	HBL5366CA	PS5366SSAN	5366AN	5366-CA
Plug 20A 250V 2 Pole 3 Wire Grounded (6-20P)	HBL5466CA	PS5466SSAN	5466AN	5466-CA
Plug 20A 3 Phase 250V 3 Pole 4 Wire Grounded (15-20P)	HBL8421C	Not Available	Not Available	Not Available
Plug 30A 3 Phase 250V 3 Pole 4 Wire Grounded (15-30P)	HBL8432C	5741-AN	8432AN	8432-P
Plug 50A 3 Phase 250V 3 Pole 4 Wire Grounded (15-50P)	HBL8452C	5751-AN	8452AN	8452-P

H. Plugs - Cord mounted Locking Nylon Grounding - Type to match Outlet Devices as follows:

Type	Hubbell	Pass & Seymour	Cooper	Leviton
Locking Plug 15A 125V 2 Pole 3 Wire Grounded (L5-15P)	HBL4720C	PSL515-P	4721N	4720-C
Locking Plug 20A 250V 2 Pole 3 Wire Grounded (L6-20P)	HBL2321	L620-P	CWL620P	2321
Locking Plug 30A 250V 2 Pole 3 Wire Grounded (L6-30P)	HBL2621	L630-P	CWL630P	2621
Locking Plug 20A 3 Phase 250V 3 Pole 4 Wire Grounded (L15-20P)	HBL2421	L1520-P	CWL1520P	2421

I. Plugs - Cord mounted Corrosion Resistant Locking Nylon Grounding - Type to match Outlet Devices as follows:

Type	Hubbell	Pass & Seymour	Cooper	Leviton
Corrosion Resistant Locking Plug 20A 125V 2 Pole 3 Wire Grounded (L5-20P)	HBL23CM11	CRL520-P	CRL520P	23CM-11
Corrosion Resistant Locking Plug 20A 125/250V 3 Pole 4 Wire Grounded (L14-20P)	HBL24CM11	CRL1420-P	CRL1420P	Not Available
Corrosion Resistant Locking Plug 20A 3 Phase 250V 3 Pole 4 Wire Grounded (L15-20P)	HBL24CM21	Not Available	CRL1520P	Not Available
Corrosion Resistant Locking Plug 30A 3 Phase 120/208V 4 Pole 5 Wire Grounded (L21-30P)	HBL28CM11	Not Available	Not Available	Not Available

J. Pin & Sleeve - Insulated Water Tight - Type Outlet Devices: Specification grade as follows:

Type	Hubbell	Pass & Seymour	Cooper	Leviton
Water Tight Receptacle 30A 250V 2 Pole 3 Wire Grounded (Non-Nema)	HBL330R6W	PS330R6W	CD330R6W	330R6W
Water Tight Receptacle 60A 250V 2 Pole 3 Wire Grounded (Non-Nema)	HBL360R6W	PS360R6W	CD360R6W	360R6W

K. Boots: Weatherproof Boots for Locking Plug and Connector Bodies - Type to match Devices as follows:

Type	Hubbell	Pass & Seymour	Cooper	Leviton
Corrosion Resistant Boots for Locking Plug and Connector 20/30A 125V (L5-20)	HBL60CM31 & HBL60CM32	CRL2030-RBP & CRL2030-RBC	BM1 & BM2	6031-Y & 6032-Y
Corrosion Resistant Boots for Locking Plug and Connector 20/30A 125/250V 3 Pole 4 Wire Grounded (L14-20)	HBL60CM35 & HBL60CM36	CRL2030-RBP & CRL2030-RBC	BL1 & BL2	6033-Y & 6034-Y
Corrosion Resistant Boots for Locking Plug and Connector 20/30A 3 Phase 250V 3 Pole 4 Wire Grounded (L15-20)	HBL60CM35 & HBL60CM36	CRL2030-RBP & CRL2030-RBC	BL1 & BL2	6033-Y & 6034-Y
Corrosion Resistant Boots for Locking Plug and Connector 30A 3 Phase 120/208V 4 Pole 5 Wire Grounded (L21-30)	HBL60CM35 & HBL60CM36	CRL2030-RBP & CRL2030-RBC	BL1 & BL2	6033-Y & 6034-Y

L. Cover Plates:

1. Nylon cover plates for flush mounted devices.
2. Galvanized steel plates where devices are installed on exposed fittings or boxes.
3. 302 stainless steel cover plates for recessed outlet boxes in masonry walls.

4. Blank cover plate on all boxes without device.

Type	Thomas & Betts	Hubbell	Intermatic	Pass & Seymour
Single gang GFCI duplex receptacle, weatherproof, while-in-use, lockable vertical metallic cover plate	Red Dot CKMUV	WP26M	WP1010M XD	WIUCAST 1
Single gang GFCI duplex receptacle, weatherproof, while-in-use, lockable horizontal metallic cover plate	Red Dot CKMU	WP26MH	WP1010M XD	WIUCAST 1
Single gang deep box twistlock receptacle, weatherproof, while-in-use, lockable vertical metallic cover plate	Red Dot CKLSVLU	WP7D	WP1250M VXD	Not Available
Double gang two GFCI duplex receptacles, weatherproof, while-in-use, lockable vertical metallic cover plate	Red Dot 2CKU	Not Available	WP1030M XD	Not Available

5. Unless otherwise noted, wiring devices and cover plates shall be white nylon.
6. Blank Cover Plates: On boxes without devices or fixtures, provide same type and color as those installed on devices in the same room or area.
7. Isolated ground receptacles: Orange nylon cover plates with circuit number printed in 3/16 inch black lettering on clear adhesive label (Brady label or equal) adhered to plate.
8. Cover plates for wiring devices mounted in FRP or NRP panels shall match the color of FRP or NRP panels.

2.6 WIRE CONNECTORS

A. Splices:

1. #8 AWG and Smaller: [Ideal Wingnut](#), [3M Scotchlok](#), or equal connectors of proper size. 3M No. 567 in-line self-stripping connectors will be permitted only at ballast lead connections in fluorescent light rows.
2. #6 AWG and Larger: Solderless lugs and connectors.

PART 3 - EXECUTION

3.1 INSTALLATION - GENERAL

- A. Install specified materials in accordance with manufacturer's recommendations.
- B. Where switches are ganged, provide permanently installed steel barriers between switches. Where or provide separate boxes and separate coverplates for each circuit.
- C. Access to Equipment: Coordinate access doors to allow for easy access of equipment for repair and maintenance.
- D. Trenching:
  1. Use caution when digging around any underground conduit system.
  2. Contact local utility companies before excavation begins. Dig trench at proper width and depth for laying pipe, conduit, or cable. Cut trench banks vertical, if possible, and remove stones from bottom of trench as necessary to avoid point-bearing. Overexcavate wet or unstable soil, if encountered, from trench bottom as necessary to provide suitable base for continuous and uniform bedding.
  3. Remove excavated materials not required or not suitable for backfill in accordance with governing regulations. Dispose of structures discovered during excavation as specified herein. .
  4. Transport materials removed from excavation with appropriate vehicles and dispose off-site to areas which are approved for disposal by governing authorities and appropriate property owners.
  5. Conform to applicable regulatory procedures when hazardous or contaminated materials are discovered.
  6. Prevent surface water from flowing into trenches or other excavations by temporary grading or other methods, as required. Remove accumulated water in trenches.
  7. Open pumping with sumps and ditches shall be allowed, provided it dose not result in boils, loss of fines, softening the ground, or instability of slopes.
  8. Trench width below top of pipe shall not be less than 12-inches or more than 18-inches wider than outside surface of pipe or conduit that is to be installed.

9. Trench depth requirements measured from finished grade or paved surface shall be 24-inches minimum to top of conduit or meet all applicable codes and ordinances, whichever is more stringent.
10. Accurately cut trenches for pipe or conduit that is to be installed, 4-inches below bottom of pipe and to the width as specified herein. Place 4-inches of bedding material, compact in bottom of trench, and accurately shape to conform to lower portion of pipe barrel.
11. Place geotextile fabric where required for additional stabilization prior to placement of base course as specified herein.
12. Geotextile Fabric for Stabilization
  - a. Mirafi HP370 or HP570 by [Mirafi/Tencate](#).
  - b. Typar SF40 or SF56 by [Dupont](#).
  - c. LINQ GTF-200 or 300 by [Thrace-LINQ](#).
  - d. TerraTex HD by [Hanes Geo Components](#).
13. Backfill after pipe or conduit has been installed. Backfill trench with sand or aggregate materials with No. 4 maximum size aggregate.
14. Backfill trenches to existing contours and elevations with unfrozen materials. Match finished surface with same material as surrounding surface.
15. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces.
16. Fill materials shall be placed in lifts or layers not to exceed 8-inches loose measure and compacted to 95 percent of maximum density, in accordance with ASTM D 698, (or 92 percent of the maximum density, in accordance with ASTM D 1557) at moisture content of not less than 1 percent below and not more than 3 percent above optimum moisture content. Exercise proper caution when compacting immediately over top of pipes or conduits. Water jetting or flooding is not permitted as method of compaction.
17. Pavement replacement shall match existing adjacent pavement profile.

E.

### 3.2 HANGERS AND SUPPORTS

- A. Hangers and Supports are specified in Section 16050.

### 3.3 WIRE

- A. Tie wrap groups of conductors in switchboards and panel boards.

### 3.4 CONDUIT

- A. Installation:

1. Install conduit concealed, except in unfinished areas and where indicated on Drawings.
2. Support conduit by means of specified hangers.
3. Clean PVC conduit per manufacturer's recommendations before application of solvent cement.
4. Coordinate flashings where conduit penetrates roof membrane.
5. Paint metallic conduit under concrete slab or where installed in contact with earth. Apply two 6 mil coats of PVC or Asphalt paint continuously along entire length of conduit prior to installation below grade. Do not run conduit in concrete slab.
6. Install flexible metal conduit or liquid tight flexible metal conduit for final connections to dry-type transformers, baler, air compressors, HVAC equipment, motors and other vibrating equipment.
7. Coordinate installation of conduit in masonry work.
8. Do not install conduit under slab unless indicated on Drawings. Conduit installed below slab shall be galvanized rigid metal (GRC), intermediate metal conduit (IMC), or Schedule 40 PVC. Provide exterior coated GRC bends and elbows for all underground conduit.
9. Route above grade conduit parallel or perpendicular to building lines.
10. Maintain minimum of 6 inches clearance at flues and heat sources.
11. Install GRC conduit when penetrating from below grade outdoors or penetrating concrete slabs, Including elbow.
12. Install GRC elbow on all conduit runs below grade that have 45° bends or greater.

13. Install double locknut and bushings when terminating GRC or IMC conduit, except where conduit terminates in threaded hub.
14. Install insulated throat bushings on all PVC conduit runs.

B. Location:

1. Galvanized Rigid Metal Conduit (GRC): Permitted for general exposed or concealed work above or below grade.
2. Intermediate Metal Conduit (IMC): Permitted for general exposed or concealed work above or below grade.
3. Electrical Metallic Tubing (EMT): Permitted for general exposed or concealed work above grade.
4. Polyvinyl Chloride rigid Nonmetallic Conduit (PVC) unless noted otherwise on drawings: Permitted for below-grade use when permitted by local governing codes..
5. Flexible Metal Conduit: Permitted in attic spaces and exposed in lengths of 6 feet or less for connections to equipment in dry areas. Not permitted for general exposed or concealed work. For connection of recessed light fixtures in suspended ceilings and connection of other equipment subject to vibration.
6. Liquid tight Flexible Metal Conduit: Permitted exposed in lengths of 6 feet or less for connections to food service equipment, refrigeration equipment and other vibrating equipment in damp locations where rigid connections are not suitable.
7. MC Cable: Permitted only where concealed inside partitions and above finished ceilings. Cable exposed on walls or in open bar joist areas will not be permitted. Cut cable with manufacturer's recommended armor stripping tool. Provide manufacturers approved connectors.

### 3.5 WIRING DEVICES

- A. Replace outlets or devices improperly located or installed. Set outlets and devices plumb or horizontal and extend to, but not project above, finished surface.
- B. Unless otherwise noted, receptacles, switches, and other wiring devices shall not be mounted back-to-back.
- C. Install receptacles so that the ground prong is in the down position.

### 3.6 WIRE CONNECTIONS

- A. Make final connection of motors, starters, disconnects, and other items furnished under other Sections.

### 3.7 FIRE AND SECURITY ALARM SYSTEM ROUGH-IN

- A. Install fire alarm/security alarm conduit system, raceways, 120 volt supply connections, and fire alarm grounding conductor.

### 3.8 PROTECTION

- A. Protect installed products from damage until completion of construction operations.

END OF SECTION

## SECTION 16402 - LOW VOLTAGE SERVICE AND DISTRIBUTION

## PART 1 GENERAL

## 1.1 SUMMARY

- A. Section Includes:
1. Owner furnished transformers for installation by Contractor.
  2. Electrical service and distribution equipment including the following:
    - a. Contactors.
    - b. Fuses.
- B. Related Requirements: The following list is intended to aid in locating work related to or dependent on the scope of Work in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
1. Section 01500 – Temporary Facilities and Controls. For Temporary Power Requirements.
  2. Section 16050 - Basic Electrical Materials and Methods. For installation of equipment. Contact information and Contractor's scheduling requirements for Owner's Independent Power Systems Study Engineer (PSSE).
  3. Section 16080 - Protective Device Settings Report.
  4. Section 16442 – Branch Circuit Panelboards.
  5. Appendix A – Products and Work by Owner or Separate Contractor: Manufacturers, suppliers, performance, and general procedures related to Owner furnished products.
  6. Appendix B – Testing, Inspection and Observation by Owner: Procedures for inspection, testing, and documentation by Owner furnished testing laboratory.
    - a. Owner's Independent Power Systems Study Engineer's (PSSE) arc flash risk assessment at completion of electrical work.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. National Fire Protection Association (NFPA)
1. NFPA 70 - National Electrical Code (NEC).

## 1.3 CLOSEOUT SUBMITTALS

- A. Submit the following as a part of closeout submittals in accordance with Section 01770.
- B. Contractor's Field Test and Inspection Reports:
1. Ground Fault Protection Testing Report: Within one week after completion of inspections, provide a certified ground fault testing and inspection report to Owner's Construction Manager and Engineer of Record. Include the following:
    - a. Identification and scanning results for each switchboard tested.
    - b. Record of noted deficiencies and elected remediation.
    - c. Names and signatures of inspection contractors and General Contractor.
  2. Test reports shall be available to the Authorities Having Jurisdiction upon request.

## 1.4 QUALITY ASSURANCE

- A. Provide ground fault protection equipment tests and inspections by qualified agencies regularly engaged in testing and inspecting equipment of the same nature in accordance with the requirements of NFPA 70.

## 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Storage and Protection: Provide proper facilities for handling and storage of materials to prevent damage. Keep materials dry, fully protected from weather.

**PART 2 PRODUCTS**

**2.1 OWNER FURNISHED PRODUCTS**

- A. Owner’s Electrical Equipment Supplier will furnish transformers as scheduled and shown on Drawings and as specified in Appendix A (Section 16402) for installation by Contractor.

**2.2 MANUFACTURERS**

- A. Items of electrical distribution system shall be manufactured by one of the following, unless otherwise indicated on Drawings.
  1. Cutler Hammer/Eaton.
  2. GE/ABB.
  3. Siemens.
  4. Square D.
- B. Equipment shall bear name and trademark of manufacturer as listed above.

**2.3 CONTACTORS**

- A. Provide contactors as indicated on Drawings: General Electric CR463M40BJA10A0 or equal.
- B. Industrial duty type; silver alloy, double break contacts, convertible with NO and NC indicators; capable of adding poles in the field; number and rating of poles as indicated on the Drawings or required by the load controlled; typed directory affixed to the inside of the enclosure door listing all branch circuits switched and the control power branch circuit.
- C. Mechanically Held Type, control interface shall be 2-wire input module.
- D. Coil and Control Voltage as specified on drawings.
- E. Short circuit current rating:
  1. 10,000A at 240V Maximum
  2. 14,000A at 480V Maximum
- F. Enclosures:
  1. NEMA 1

**2.4 FUSES**

- A. Install fuses as indicated on Drawings.
- B. Subject to compliance with project requirements, provide fuses as manufactured by one of the following:
  1. Bussmann.
  2. Gould-Shawmut.
  3. Littelfuse.
- C. Acceptable Fuse Types:

Size	Bussman	Gould-Shawnut	Littelfuse	UL Listed
601 Amperes and Above, 480 Volt	Low-Peak, KRP-C	A4BY	KLLU	Class L

600 Amperes and Below, 480 Volt	LPS-R-SP	A6D	KLSR	RK1
600 Amperes and Below, 250 Volt	LPN-RK-SP	A2D	KLNR	RK1
Motor Loads, Transformers (Circuits with Heavy Inrush), 600 Amperes and Below	FRN-R, 250V FRS-R, 600V	TR, 250V TRS, 600V	FLNR, 250V FLSR, 600V	RK5 RK5

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install materials in accordance with manufacturer's recommendations, power company requirements, and as indicated on Drawings.
- B. Branch circuits shall be connected exactly as indicated on Panel Schedule.

3.2 ELECTRICAL SERVICE

- A. Perform Work in compliance with the local utility's requirements.

3.3 TEMPORARY POWER

- A. Provide temporary power during construction in accordance with Section 01500.

3.4 FIELD QUALITY CONTROL BY CONTRACTOR

- A. Ground Fault Protection Equipment Testing: After installation of equipment and prior to initiating service, test ground fault protection equipment by primary current injection in accordance with the Performance Testing requirements of NFPA/NEC.

3.5 OWNER TESTING AND INSPECTION (T&I)

- A. Owner's Engineer of Record and Power Systems Study Engineers (PSSE) will perform testing and inspection (T & I) as specified in Appendix B (Section 16050).

END OF SECTION



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## SECTION 16410 - ENCLOSED SWITCHES AND CIRCUIT BREAKERS

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
1. Safety disconnect switches and enclosed circuit breakers.
- B. Related Requirements:
1. 16100 - Wiring Methods.
  2. 16402 – Low Voltage Service and Distribution
  3. 16442 – Branch Circuit Panelboards

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.
- B. National Electrical Manufacturers Association (NEMA).
1. NEMA 250 – Enclosures for Electrical Equipment (1000 volts maximum).

## PART 2 - PRODUCTS

## 2.1 SAFETY DISCONNECT SWITCHES

- A. Requirements:
1. Furnish and install all disconnect switches required for full code compliance except where switches are furnished with equipment specified in other DIVISIONS of the specifications in which case, install only.
  2. Fusible Switch Assemblies: Shall be NEMA KS 1, Type HD (Heavy Duty) horsepower rated, load interrupter switch with externally operable handle interlocked to prevent opening front cover with switch in ON position. Handle lockable in OFF position. Fuse clips shall accommodate Class R unless indicated otherwise. Fusible switches shall be UL rated 200,000 AIC with Class R,J or L fuses.
  3. Nonfusible Switch Assemblies: Shall be NEMA KS 1, Type HD (Heavy Duty) load interrupter switch with externally operable handle interlocked to prevent opening front cover with switch in ON position. Handle lockable in OFF position.
  4. Switches controlling or disconnecting motor loads shall be horsepower rated and approved for motor control service except where NEC 430-109 exceptions apply.
  5. Line and load terminals of disconnect switches rated 100 amperes or less shall be rated for 75 degrees C.
  6. Provide electrical interlock to de-energize control wiring as required.
  7. All disconnect switches shall be capable of being locked open.
  8. Controller disconnect switches shall be within sight of the controller. If the disconnect switch of any controller is out of site of, or more than 50 feet from, its related motor, then a disconnecting switch shall be added within sight of the motor. The switch at the motor may be deleted only where allowed by the NEC and where approved by the Engineer.
  9. Install fuses specified in SECTION 16402 – LOW VOLTAGE SERVICE AND DISTRIBUTION in all fusible switches.
  10. Provide adhesive label on inside door of each switch indicating UL fuse class and size for replacement.
  11. Switches used for service entrance shall have a UL Service Entrance Label.
- B. Enclosures:
1. NEMA Type 1 general purpose enclosures shall be used for interior dry locations unless otherwise indicated.
  2. NEMA Type 3R raintight enclosures shall be used for exterior locations unless otherwise indicated.

## 2.2 ENCLOSED CIRCUIT BREAKERS

### A. References:

1. UL489 - Molded Case Circuit Breakers and Circuit Breaker Enclosures.
2. UL50 - Cabinets and Boxes.
3. NEMA 250 - Enclosures for Electrical Equipment.

### B. Requirements:

1. Provide enclosed circuit breakers where indicated on the Drawings and as required by the specifications.
2. Circuit breakers shall be molded case, thermal magnetic type unless indicated otherwise on the Drawings.
3. Circuit breakers enclosures shall have an integrated equipment rating suitable for the available fault current.
4. Circuit breaker enclosures identified for use as service equipment are to be labeled for Service Entrance application.
5. Circuit breaker operating handles shall be operable from outside of enclosures and shall be capable of being locked in the open position.
6. Reference SECTION 16442 – BRANCH CIRCUIT PANELBOARDS for circuit breaker specifications.

### C. Enclosures:

1. NEMA Type 1 general purpose enclosures shall be used for interior dry locations unless otherwise indicated.
2. NEMA Type 3R raintight enclosures shall be used for exterior locations unless otherwise indicated.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install motor and circuit disconnects in accordance with manufacturer's recommendations. Applicable Codes shall take precedence over drawing details.
- B. Provide properly sized grounding lug and terminations for all disconnect switches.

END OF SECTION

## SECTION 16442 - BRANCH CIRCUIT, DISTRIBUTION PANELBOARDS, AND SWITCHBOARDS

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes: Owner furnished equipment for installation by Contractor including the following:
  - 1. Branch circuit and distribution panelboards.
  - 2. Non-service entrance switchboards.
- B. Related Requirements: The following list is intended to aid in locating products and work related to or dependent on the scope in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
  - 1. Section 16050 - Basic Electrical Materials and Methods. Grounding. Contact information and Contractor's scheduling requirements for Owner's Independent Power Systems Study Engineer (PSSE).
  - 2. Section 16080 - Protective Device Settings Report.
  - 3. Appendix A – Products and Work By Owner or Separate Contractor: Manufacturers, suppliers, performance, and general procedures related to Owner furnished products.
  - 4. Appendix B – Testing, Inspection and Observation by Owner: Procedures for inspection, testing, and documentation by Owner furnished testing laboratory.
    - a. Owner's Independent Power Systems Study Engineer's arc flash risk assessment at completion of electrical work.

## 1.2 REFERENCES

- A. National Electrical Code (NFPA-70), and interim amendments in effect.
- B. NFPA 101 – Life Safety Code

## 1.3 QUALITY ASSURANCE

- A. Comply with latest edition of the National Electrical Code (NFPA-70), and interim amendments in effect.
- B. Comply with local and state, utility regulations and laws.
- C. Furnish productions listed and classified by Under Writers Laboratories, Inc or other testing firm acceptable to the authority having jurisdiction as suitable for purpose specified and shown.
- D. Comply with NFPA 101 – Life Safety Code. Where referenced in the Contract Documents, NFPA 101 shall indicate the latest edition including all interim amendments in affect.

## 1.4 DELIVERY, STORAGE AND HANDLING

- A. Storage and Protection: Provide proper facilities for handling and storage of materials to prevent damage. Keep materials dry, fully protected from weather.

## 1.5 SEQUENCING AND SCHEDULING

- A. The responsibility of Work under this Section includes, but is not limited to, the following:
  - 1. Coordinate and schedule delivery of equipment to site.

## PART 2 - PRODUCTS

## 2.1 OWNER FURNISHED PRODUCTS

- A. Owner's Electrical Equipment Supplier will furnish equipment within the scope of this Section as scheduled and shown on Drawings and as specified in Appendix A (Section 16442) for installation by Contractor.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine surfaces and adjacent areas in which Work under this Section is to be performed. Report in writing to Wal-Mart Construction Manager prevailing conditions that may adversely affect satisfactory execution of Work. Do not proceed with Work until unsatisfactory conditions have been corrected.
- B. Starting Work constitutes acceptance of the existing conditions and the Contractor shall then, at his expense, be responsible for correcting all unsatisfactory and defective Work encountered.

#### 3.2 INSTALLATION

- A. Install materials in accordance with manufacturer's recommendations and as indicated on Drawings.
- B. Mounting Accessories: For anchors, mounting channels, bolts, washers, and other mounting accessories, comply with requirements in Section 16050 and manufacturer's recommendations.
- C. Switchboards shall be securely bolted to a minimum 4 inch housekeeping pad. Extend pad a minimum of 2 inches beyond the edges of the equipment.
- D. Support and secure conductors within the switchboard according to NFPA 70.
- E. Install overcurrent protective devices and set all field-adjustable settings per overcurrent protective device coordination study parameters.
- F. Install filler plates in unused spaces of panel-mounted sections.
- G. Branch circuits shall be connected exactly as indicated on Drawings.

#### 3.3 FIELD QUALITY CONTROL

- A. Inspect completed installation for physical damage, proper alignment, anchorage, and grounding.
- B. Measure steady state load currents at each panelboard feeder; rearrange circuits in the panelboard to balance the phase loads within 20% of each other. Maintain proper phasing for multi-wire branch circuits.
- C. Check tightness of bolted connections, and circuit breaker connections using calibrated torque wrench or torque screwdriver per manufacturer's written specification.
- D. Test ground fault systems by operating push-to-test button.
- E. Adjust all operating mechanisms for free mechanical movement per manufacturer specifications.
- F. Switchboard Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections to ensure compliance with manufacturer's recommendations.

#### 3.4 OWNER TESTING AND INSPECTION (T&I)

- A. Owner's Engineer of Record and Power Systems Study Engineers (PSSE) will perform testing and inspection (T & I) as specified in Appendix B (Section 16050).

END OF SECTION

16442-2

## SECTION 16500 - LIGHTING

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Contractor furnished and installed Lighting fixtures.
  - 2. Owner furnished lighting for installation by Contractor.
- B. Related Requirements:
  - 1. Appendix A – Products and Work by Owner or Separate Contractor
    - a. General procedures related to Owner furnished products and transport, handle, store and protect products.
    - b. Manufacturers, suppliers, and vendor contacts and product names and numbers related to Owner furnished products.

## 1.2 QUALITY ASSURANCE

- A. Fixtures and their electrical components will bear the label of a nationally recognized testing laboratory.

## 1.3 DELIVERY, STORAGE, AND HANDLING

- A. Storage and Protection: Provide facilities for handling and storage of materials to prevent damage to edges, ends, and surfaces. Keep materials dry and protected from weather. Fixtures stored outside without a permanent overhead roof and shelter shall be replaced at Contractor expense. Examples of approved storage include drop trailers, storage inside warehouse, or other Owner Construction Manager approved storage area meeting these criteria. Fixtures showing signs of rust or weathering shall be replaced at Contractor's expense.
- B. Contact selected distributor 4 weeks prior to desired delivery date to arrange for delivery of lighting fixtures.

## PART 2 - PRODUCTS

## 2.1 OWNER FURNISHED LIGHTING FIXTURES FOR INSTALLATION BY CONTRATOR

- A. Appendix A – Products and Work by Owner or Separate Contractor Section 16500 and Lighting Fixture Schedule.

## PART 3 - EXECUTION

## 3.1 INSTALLATION

- A. Install lighting fixtures, lamps, lighting panels, and connections in accordance with manufacturer's recommendations and as indicated on Drawings.
  - 1. LED Fixtures will arrive with protective film. Film shall not be removed until all painting and deep cleaning is completed. Removal of film prior to the cleaning procedure may result in damage and replacement at Contractor's expense.
- B. Coordinate exact mounting location of light fixtures with building structure and other trades prior to installation. Continuous rows shall be installed straight and true.
- C. Attach fixtures to ceiling grid. Install four to six feet of flexible conduit from recessed fixtures installed in lay-in ceiling grid systems to outlet boxes supported from building structural system.

- D. Maintain all light fixtures and lamps during construction, and coordinate replacement of any defective lamps with Owner's lighting vendor prior to Certification of Substantial Completion. Notify Owner's lighting vendor immediately of any damaged fixtures or lamps delivered to the jobsite and make arrangements to have them replaced.
- E. Verify ceiling and wall details. Install fixtures complete with proper mounting arrangements for ceiling or wall construction encountered.
- F. Lighting fixtures and lamps shall be clean and free of building paint over-spray one week prior to possession.
- G. Provide all additional hardware required to complete installation such as nuts, bolts, threaded rods and Unistrut channels.

### 3.2 MAINTENANCE AND REPLACEMENT DURING CONSTRUCTION

- A. Provide material and labor to deep clean new lighting fixtures with anti-static cleaning fluid. Replace lamps with building paint overspray one week prior to possession at Contractor's expense.
- B. Maintain lighting fixtures, ballasts, LED drivers, and lamps during construction, possession, and until store Grand Opening. Coordinate replacement of defective, lost, or damaged equipment with vendor.
- C. Owner Responsibility (Including Vendor):
  - 1. Costs for replacement for normal failure covered by warranty of any fixture, lamp, or ballast prior to Grand Opening. Evaluation of abnormally high failure percentage and replacement covered under warranty will be provided by vendor on site.
  - 2. Costs for replacement of parts damaged during shipment. Charges will be made to shipping carrier or responsible party.
- D. Contractor Responsibility:
  - 1. Coordinate vendor on-site evaluation of abnormal component failures of ballast and lamps at least two weeks prior to Grand Opening. Provide labor for routine and normal maintenance of equipment including troubleshooting and determination of lighting failure.
  - 2. Material and labor costs for replacement of loss, breakage, or other damage due to fault of Contractor including lamps.
  - 3. Contact vendor to order replacement parts in time to have all fixtures fully operational prior to Grand Opening.
- E. Replacement Procedure - General:
  - 1. Immediately notify vendor and request replacement of damaged fixtures, ballasts or lamps delivered to the jobsite.
  - 2. If shipping damage is concealed, notify carrier and vendor within 15 days of acceptance of the freight. Provide vendor a copy of the written notification sent to the carrier.
- F. Additional Ballast Replacement Procedure:
  - 1. Order replacement ballast(s) or LED driver(s) from vendor. Request Return Authorization number from vendor to return defective ballast no later than Grand Opening.
  - 2. Return all defective ballast(s) or LED driver(s) to vendor. Vendor will arrange pickup and return, including shipping costs, of defective ballast(s) or LED driver(s). Cost for ballast(s) or LED driver(s) not returned within the specified time frame or returned but not defective will be automatically charged to Contractor.

END OF SECTION

SECTION 16700 - COMMUNICATIONS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
  - 1. Owner Furnished and Installed Voice/Data System.
  - 1. Related Requirements:
  - 2. 16100 - Wiring Methods: Outlet boxes and conduit fittings.
  - 3. Appendix A – Products and Work by Owner or Separate Contractor.
    - a. General procedures related to Owner furnished products and transport, handle, store and protect products.
    - b. Manufacturers, suppliers, and vendor contacts and product names and numbers related to Owner furnished products.

PART 2 - PRODUCTS

2.1 OWNER FURNISHED PRODUCTS

- A. The following products will be Owner furnished and installed as specified in Appendix A (Section 16700).
  - 1. Voice/Data cable equipment.

B. EXECUTION

2.2 INSTALLATION

- A. Install Voice/Data conduit system, Voice/Data grounding conductor, and signal systems as indicated on Drawings.
- B. Voice/Data Conduit System: Install conduit system as indicated on Drawings, including:
  - 1. Voice/Data service conduit.
  - 2. Other conduits as indicated on Drawings. Install #14 AWG soft iron pull wire or heavy nylon cord in each conduit for pulling the Voice/Data cable to each termination point.
  - 3. Install outlet boxes conforming to requirements of Section 16100. Include cover plates.

END OF SECTION



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**APPENDIX A - PRODUCTS AND WORK BY OWNER OR SEPARATE CONTRACTOR**

## PART 1 - GENERAL

## 1.1 SUMMARY

## A. Appendix Includes:

1. Work provided by Owner including Owner furnished products and installation as associated with and as specified in the individual specification sections and the Drawings.
2. Owner furnished equipment schedules and tables formerly included in individual specifications sections.
3. Information contained herein under Section titles corresponds to the individual Specification Section titles and numbers included in Division 2 through 16 and Drawing references.
4. Owner's Preferred Flooring Contractor Specifications: Division 3 Flooring scopes of work that include the Owner's Preferred Flooring Contractor (PFC) program, including allocation of responsibility between Contractor and PFC, are located in the individual Specifications Section and not in this Appendix A for the purpose of consolidation and clarity for the PFC.

## B. Index of Sections (Quick Links): All sections listed may not be applicable to all projects.

1. [Section 03531 – Architectural Concrete Overlayment](#)
2. [Section 05120 – Structural Steel](#)
3. [Section 05210 - Steel Joists](#)
4. [Section 05300 - Metal Deck](#)
5. [Section 05500 - Metal Fabrications](#)
6. [Section 06065 – Plastic Materials](#)
7. [Section 06400 – Architectural Woodwork and Millwork Assemblies](#)
8. [Section 06424 – Protective Surfacing](#)
9. [Section 06610 – Glass Fiber Reinforced Plastic \(FRP\)](#)
10. [Section 07721 - Manufactured Curbs](#)
11. [Section 07900 - Joint Sealers](#)
12. [Section 08110 – Steel Doors and Frames](#)
13. [Section 08150 – Recycled Plastic Interior Man Doors](#)
14. [Section 08305 – Side Folding Grille](#)
15. [Section 08383 – Traffic Doors](#)
16. [Section 08462 - Automatic Sliding Entrance Doors](#)
17. [Section 08710 - Door Hardware](#) (reference only)
18. [Section 08800 - Glazing](#) (reference only)
19. [Section 09310 – Ceramic Tile](#)
20. [Section 09650 - Resilient Flooring](#)
21. [Section 09655 – Resilient Base and Accessories](#)
22. [Section 09656 – Recycled Rubber Commercial Sheet Flooring](#)
23. [Section 09680 - Carpet](#)
24. [Section 09720 – Decorative Faux Tile Wall Panels](#)
25. [Section 10160 – Metal Toilet Compartments](#)
26. [Section 10260 - Wall and Corner Guards](#)
27. [Section 10736 – Metal Canopy](#)
28. [Section 10810 - Toilet Accessories](#)
29. [Section 11141 - Oil and Filter Waste Containment Devices](#)
30. [Section 11400 - Food Service Equipment](#)
31. [Section 13030 - Modular Building Components](#)
32. [Section 13300 - Vertical Barrier Net System](#)
33. [Section 13810 - Building Automation System \(BAS\)](#)
34. [Section 13900 - Fire Suppression](#)
35. [Section 13920 – Fire Pumps](#)
36. [Section 14580 – Pneumatic Tube System](#)

37. [Section 15100 - Building Services Piping and Equipment](#)
38. [Section 15410 - Plumbing Fixtures](#)
39. [Section 15600 - Refrigeration Systems](#)
40. [Section 15700 - Heating, Ventilating, And Air Conditioning Equipment](#)
41. [Section 16100 - Wiring Methods](#)
42. [Section 16402 - Low Voltage Service and Distribution](#)
43. [Section 16442 – Branch Circuit, Distribution Panelboards, and Switchboards](#)
44. [Section 16452 – Track Busway Systems](#)
45. [Section 16500 - Lighting](#)
46. [Section 16525 – Site Lighting](#)
47. [Section 16700 - Communications](#)
48. References

- C. Related Requirements: The following list is intended to aid in locating products and work related to or dependent on the scope in this Appendix. The list is included for information only and is not intended to be inclusive of all project requirements.
1. Contract Drawings: Owner furnished product information not included in this Appendix A.
  2. Owner Supplier Index: Complete Supplier alignment information and relevant Buyout information.
  3. Appendix B: Owner furnished Testing, Inspection, and Observation Services.

## 1.2 GENERAL

- A. Owner’s Supplier and associated products will be as specified hereinafter as applicable. Application of information herein shall be only to the extent as stated and referenced in corresponding specifications sections or as shown on the drawings.
- B. Unless otherwise specified, provisions specified herein are included as requirements for Owner’s Suppliers, vendor, or separate contractors and shall be considered information only to Contractor.

## 1.3 DEFINITIONS

- A. Owner: Defined in Construction Agreement. Specific corporate divisions, titles, and address locations of the Owner may also be referred to as “Walmart”.

## 1.4 RESPONSIBILITIES FOR OWNER FURNISHED PRODUCTS

- A. Product Installation: Equipment and products will be furnished by the Owner for installation by the Contractor unless otherwise specified herein.
- B. Product Delivery: Unless otherwise specified, Owner’s supplier will deliver products to jobsite for Contractor to receive on delivery date established by Contractor. If significant order lead times are required for a specific product, lead time shall be as specified by the product supplier.
- C. Coordination:
1. Walmart Realty Execution Team Products and Equipment: Contractor shall contact [wmpotracksupport@lumatrac.com](mailto:wmpotracksupport@lumatrac.com) immediately after Award of Contract to initiate registration in the GC Communicator (GCC) online program for Owner supplier scheduling and coordination.
  2. Coordination of order and delivery for Owner furnished products and equipment not facilitated by Walmart realty execution team are specified in Section 01600.
- D. Owner Responsibilities:
1. Arrange for delivery of supplier furnished shop drawings, product data, samples, and installation instructions to Contractor.
  2. Arrange for delivery of replacement products upon notification from Owner’s Construction Department of shortages, damage, or defects in products.

3. Arrange for repair of product manufacturing defects upon notification from Owner’s Construction Department.
  4. Arrange and pay for product delivery to site, in accordance with agreed upon construction management plan in Specifications Section 01320.
  5. Deliver supplier’s shipment list of materials to Contractor.
  6. Submit claims for transportation damage.
  7. Arrange for replacement of damaged, defective, or missing items.
  8. Arrange for manufacturers’ warranties, bonds, services, and inspections, as required.
- E. Contractor Responsibilities as specified in Specifications Section 01600:
1. Submit notice of anticipated discrepancies or problems anticipated in the use of products to: Owner’s Supplier, Architect of Record, Owner, and Owner’s Construction Department.
  2. Receive and unload products at the Site when specified.
  3. Inspect products upon receipt for shortages, damaged, or defective items and report to Owner and Owner’s Construction Department.
  4. Handle products at site, including uncrating, storage, and protection unless otherwise specified.
  5. Install products when specified.
  6. Provide for installation and hook-up at time of delivery of Owner installed equipment.
  7. Protect installed products from damage.
  8. Replace items damaged by Contractor.
  9. Remove trash, debris, and rubbish.
  10. Report suspected product manufacturing defects to Owner’s Construction Manager and Product Supplier.

1.5 OWNER’S CONSTRUCTION BUYOUT SUPPLIERS

- A. Refer to the table below for suppliers assigned by the Owner’s Construction Buyout Team and their associated products.

OWNER’S SUPPLIER LIST FOR CONSTRUCTION BUYOUTS

<b>SPECIFICATION SECTION</b>	
<b>Category Description</b> (Complete owner furnished package defined in Part 2)	
<b>Supplier</b>	<b>Supplier #</b>
<b>SECTION 05120 – STRUCTURAL STEEL</b>	
<b>Structural steel - beams and columns</b>	
Ellis Steel Company, Inc	1000188921
<b>SECTION 05210 – STEEL JOISTS</b>	
<b>Steel joists and girders</b>	
New Millennium Building Systems, LLC.	1000292878
<b>SECTION 05300 – METAL DECK</b>	
<b>Metal deck</b>	
New Millennium Building Systems, LLC:	1000292878
<b>SECTION 05500 - METAL FABRICATIONS</b>	
<b>Aluminum diamond plate surface-applied protection</b>	
Concept Store Fixtures (CSF International)	1000466238
<b>Interior stainless steel surface mounted bollards</b>	
SBI Industrial	1001137314
<b>SECTION 06065 – PLASTIC MATERIALS</b>	
<b>Plastic bollard sleeve</b>	
Haines, Jones & Cadbury	1000121534
<b>SECTION 06400 - ARCHITECTURAL WOODWORK AND MILLWORK ASSEMBLIES</b>	
<b>Vision center millwork</b>	
idX	1000347050
<b>Modular pharmacy millwork</b>	
idX	1000347050
<b>Breakroom millwork</b>	
idX	1000347050
<b>Architectural slat wall panel</b>	
Haines, Jones & Cadbury	1000121534

<b>Architectural ledge system</b>	
Haines, Jones & Cadbury	1000121534
<b>SECTION 06424 – PROTECTIVE SURFACING</b>	
<b>Rigid sheet wall covering and adhesive</b>	
Haines, Jones & Cadbury	1000121534
<b>SECTION 06610 - GLASS FIBER REINFORCED PLASTIC</b>	
<b>FRP products and accessories</b>	
Haines, Jones & Cadbury	1000121534
<b>SECTION 07721 - MANUFACTURED CURBS</b>	
<b>Structural roof curbs</b>	
AES Industries, Inc.	1000059359
<b>SECTION 08110 – STEEL DOORS AND FRAMES</b>	
<b>Hollow metal doors, frames, and accessories</b>	
DH Pace, Inc.	1000050759
<b>SECTION 08150 - RECYCLED PLASTIC INTERIOR MAN DOORS</b>	
<b>Recycled plastic doors, frames, accessories, and hardware</b>	
DuraServ Corp	1000103621
<b>SECTION 08305 – SIDE FOLDING GRILLE</b>	
<b>Rod and link or perforated style side folding grill</b>	
Dynamic Closures	1000187055
<b>SECTION 08383 - TRAFFIC DOORS</b>	
<b>Full-height and café traffic doors</b>	
Chase Doors	1000037052
<b>SECTION 08462 - AUTOMATIC SLIDING ENTRANCE DOORS</b>	
<b>Auto sliding entrance doors and hardware</b>	
Stanley Access Technologies	1000152469
<b>Auto sliding entrance door threshold</b>	
Stanley Access Technologies	1000152469
<b>SECTION 08710 - DOOR HARDWARE</b>	
<b>Positive lock exit devices</b>	
Positive Lock	1000102802
<b>SECTION 09310 – CERAMIC TILE</b>	
<b>Ceramic tile</b>	
Haines, Jones & Cadbury	1000121534
<b>SECTION 09650 - RESILIENT FLOORING</b>	
<b>LVT/PVC resilient flooring</b>	
Haines, Jones & Cadbury	1000121534
<b>SECTION 09655 - RESILIENT BASE AND ACCESSORIES</b>	
<b>Rubber or vinyl resilient base, plastic base, sanitary cove base</b>	
Haines, Jones & Cadbury	1000121534
<b>SECTION 09656 – RECYCLED RUBBER COMMERCIAL FLOORING</b>	
<b>Recycled rubber resilient flooring</b>	
Haines, Jones & Cadbury	1000121534
<b>SECTION 09680 – CARPET</b>	
<b>Carpet tile</b>	
Haines, Jones & Cadbury	1000121534
<b>SECTION 09720 – DECORATIVE FAUX TILE WALL PANELS</b>	
<b>Decorative faux tile wall panels</b>	
Haines, Jones & Cadbury	1000121534
<b>SECTION 10160 - METAL TOILET COMPARTMENTS</b>	
<b>Stainless steel partitions</b>	
Haines, Jones & Cadbury	1000121534
<b>SECTION 10241 – ROOF TOP EQUIPMENT SCREENING</b>	
<b>SECTION 10260 - WALL AND CORNER GUARDS</b>	
<b>Floor mount diamond plate protection rail system for refrigerated cases</b>	
Concept Store Fixtures (CFS International)	1000466238
<b>SECTION 10260 - WALL AND CORNER GUARDS</b>	
<b>Rubber tire stops</b>	
Haines, Jones & Cadbury	1000121534
<b>Wall and Corner Guards</b>	

Haines, Jones & Cadbury	1000121534
<b>SECTION 10736 - METAL CANOPY</b>	
<b>Engineered steel canopy system</b>	
McGee Corp	1000088208
<b>SECTION 10810 - TOILET ACCESSORIES</b>	
<b>Toilet accessories</b>	
Haines, Jones & Cadbury	1000121534
<b>SECTION 11400 - FOOD SERVICE EQUIPMENT</b>	
<b>Hot Cases (RH cases)</b>	
Custom Deli Equipment Co Inc	10000958181
<b>SECTION 13030 - PHARMACY MODULAR BUILDING COMPONENTS</b>	
<b>Primary (permanent) modular pharmacy</b>	
Haines, Jones & Cadbury	1000121534
<b>SECTION 13300 - VERTICAL BARRIER NET SYSTEM</b>	
<b>Vertical barrier net system</b>	
Haines, Jones & Cadbury	1000121534
<b>SECTION 13810 - BUILDING AUTOMATION SYSTEM (BAS)</b>	
<b>Building automation system equipment</b>	
Honeywell International Inc	1000211094
<b>Walk-In Evaporator S3C Control Panel, Sporlan Gateway Router, Sporlan Network Switch</b>	
Parker Hannifin	1000929314
<b>SECTION 13900 - FIRE SUPPRESSION</b>	
<b>Sprinkler Heads</b>	
Haines, Jones & Cadbury	1000121534
<b>SECTION 14580 - PNEUMATIC TUBE SYSTEM</b>	
<b>Pharmacy pneumatic tube system</b>	
Quick Tube Systems, Inc (QTS)	1000400385
<b>SECTION 15100 - BUILDING SERVICES PIPING AND EQUIPMENT</b>	
<b>Water piping specialties</b>	
Haines, Jones & Cadbury	1000121534
<b>Drainage piping specialties</b>	
Haines, Jones & Cadbury	1000121534
<b>SECTION 15160 - SIPHONIC PRIMARY ROOF DRAIN SYSTEM</b>	
<b>Siphonic roof drains and deck drains</b>	
Haines, Jones & Cadbury	1000121534
<b>SECTION 15410 - PLUMBING FIXTURES</b>	
<b>Plumbing fixtures</b>	
Haines, Jones & Cadbury	1000121534
<b>SECTION 15600 - REFRIGERATION SYSTEMS</b>	
<b>Refrigerated Cases</b>	
Hill Phoenix Inc	1000073608
Kysor Warren EPTA USA Corporation (Heatcraft)	1000910348
<b>Remodel - Remote condensing units (RCU)</b>	
Kysor Warren EPTA USA Corporation (Heatcraft)	1000910348
<b>Remodel - Evaporators / unit coolers</b>	
Kysor Warren EPTA USA Corporation (Heatcraft)	1000910348
<b>Remodel - Compressor rack systems (HFC or CO2)</b>	
Kysor Warren EPTA USA Corporation (Heatcraft)	1000910348
<b>Leak Detection</b>	
Copeland Cold Chain LP	1000214394
<b>SECTION 15700 - HEATING, VENTILATING, AND AIR CONDITIONING EQUIPMENT</b>	
<b>Roof top air conditioning units (RTU)</b>	
Lennox Industries, Inc	1000185327
<b>Transformer</b>	
Graybar	1000574070
<b>SECTION 16442 - BRANCH CIRCUIT, DISTRIBUTION PANELBOARDS, AND SWITCHBOARDS</b>	
<b>Panelboards and Switchboards</b>	
Graybar	1000574070
<b>SECTION 16500 - LIGHTING</b>	

<b>Fixture Types: 1(Fuel), 2, 3D, 5P, 13, 15, 16, 17, 18(Fuel), 19(Fuel), 28, 30, 31, 33, 34, 35, 38, 40, 40W 42D, 66, 67, 68, 68R(Fuel), 69, 70, 73, 100</b>	
Acuity Brands Lighting (Lithonia)	1000041247
<b>Fixture Types: 22, 32, 39, 47, 72, 78</b>	
GE Lighting Solutions	1000061693
<b>Fixture Types: 1(NS, RM), 4, 4C, 5, 6, 7, 9, 10, 10R, 11, 24, 37, 45, 46, 50, 52, 56V, 57V, 58V, 63, 68R(NS, RM), 75, 85, 87, 91, 92, 95, 96</b>	
Loeb Electric Co	1000133741
<b>Fixture Types: 8, 14, 18 (NS, RM), 19 (NS, RM), 20, 26, 26A, 27, 27A, 71</b>	
REXEL	1000046047
<b>SECTION 16525 - SITE LIGHTING</b>	
<b>Site Lighting Luminaires</b>	
Loeb Electric Co	1000133741
<b>SECTION 125300 - RETAIL FURNISHINGS</b>	
<b>Pharmacy Pill Bay</b>	
Madix	1000084552
<b>Pharmacy Equipment Trees and Arms</b>	
Haines, Jones & Cadbury	1000121534
<b>Pharmacy Will Call Bars</b>	
FASTENERS FOR RETAIL INC	1000174108
<b>Pickup (PU) Wall Panel System at Front End</b>	
Haines, Jones & Cadbury	1000121534
<b>Safe</b>	
American Security Products	1000085493
<b>Gaylords (Recycling Bags) for Flooring</b>	
THE MATWORKS COMPANY	1000415250
<b>Interior Signage</b>	
MILLER ZELL INC	1000099798
<b>Exterior Signage</b>	
SPRINGFIELD SIGN & GRAPHICS INC	1000190009
SIGN CRAFTERS INC	1000155892

## 1.6 OWNER'S SUPPLIER CONTACTS

### A. Contact information for Owner Furnished Items is identified herein as follows:

1. Information for Suppliers of Owner's Construction Buyout items is shown in the Supplier Contact List for Construction Buyouts in this Article below.
2. Information for Suppliers of Owner Furnished Equipment not identified as Construction Buyouts is shown in the applicable specifications Section listed in this Appendix or on the Drawings.
3. Information for Owner Furnished and coordinated equipment, materials, or services not identified as Construction Buyouts and not otherwise specified in this Appendix A are here:
  - a. ATM: Walmart Financial Services, Mark Stephens, (479) 277-8869.
  - b. Reverse Osmosis (except Pharmacy): Primo Water – Erik DeVanie, (717) 721-8521, [Edevanie@primowater.com](mailto:Edevanie@primowater.com).
  - c. Insect Control Units: EcoLab Pest Elimination Devices – (800) 325-1671.
  - d. Restroom Scent Dispenser: [Prolitec, Inc.](http://Prolitec, Inc.) – Melissa Maker, (414) 615-4602, [mmaker@prolitec.com](mailto:mmaker@prolitec.com).
    - 1) At completion of front and rear restroom electrical and finish work, contact scent dispenser vendor.
  - e. Bulk CO2 Tank: NuCo2 – Steven Gregg, (720) 202-3672, [Steven.Gregg@nuco2.com](mailto:Steven.Gregg@nuco2.com) or Sara Bedenbaugh, [sara.bedenbaugh@nuco2.com](mailto:sara.bedenbaugh@nuco2.com).
  - f. Bulk CO2 Storage Cabinet: Chart, Inc. - Cathy Bartusek, (800) 247-4446, [cathy.bartusek@chartindustries.com](mailto:cathy.bartusek@chartindustries.com).
  - g. Floral Cases:
    - 1) Börgen, Des Moines, IA; Attn: Kim Tisdale (479) 721-3013.
    - 2) Structural Concepts, Muskegon, MI.
  - h. 18" x 12" Cart Corral Signs: "Return Flatbeds & Carts Here" (Part No. 9022):

- 1) For sourcing information, contact Muriel McSweeney, [Muriel.mcsweeney@walmart.com](mailto:Muriel.mcsweeney@walmart.com), (479) 360-3694.
- i. Vacuum Plumbing System: Haines, Jones & Cadbury, Inc; Contact: Customer Service; (800) 459-7099, Fax (479) 756-8998, [wmt@hjcinc.com](mailto:wmt@hjcinc.com).
- j. Vinyl Film, Graphic Wrap, Decals, and Installation: Clampitt Companies, LLC, Springfield, MO. Contact Randy Ralph, (479) 866-6900, [rralph@clampitt.com](mailto:rralph@clampitt.com).

**SUPPLIER CONTACT LIST FOR CONSTRUCTION BUYOUTS**

<b>Owner's Buyout Supplier</b>	<b>Contact Information</b>
Acuity Brands Lighting (Lithonia)	Walmart Team, <a href="mailto:walmartteam@acuitybrands.com">walmartteam@acuitybrands.com</a> or contact Melinda Brueggemann (317) 650-3203, <a href="mailto:Melinda.Brueggemann@acuitybrands.com">Melinda.Brueggemann@acuitybrands.com</a> or Theresa Warren (800) 207-0363, Option 3.
Advanced Insulation Concepts/Regent Insulating Doors	(800) 826-3100
AES Industries	Chad Burt, (334) 283-6578, <a href="mailto:walmart@aescurb.com">walmart@aescurb.com</a>
Arneg	Refrigeration Cases: <a href="mailto:Srice@arnegusa.com">Srice@arnegusa.com</a> (336)-956-5319
Arning Companies, Inc.	Gavin Chapman (800) 732-5074, <a href="mailto:gavin.chapman@arningco.com">gavin.chapman@arningco.com</a> or Ian Burt, <a href="mailto:ian.burt@arningco.com">ian.burt@arningco.com</a> or Micki Harrell, <a href="mailto:micki.harrell@arningco.com">micki.harrell@arningco.com</a>
Cannon Equipment	(800) 825-8501 or (507) 263-6400
Captive-Aire	Start-Up Contact: Mike Little (636) 229-9777, <a href="mailto:reg109@captiveaire.com">reg109@captiveaire.com</a> Ship Contact and Drawings: Mike Little (636) 229-9777, <a href="mailto:reg109@captiveaire.com">reg109@captiveaire.com</a> Warranty Contact: Mike Little (636) 229-9777, <a href="mailto:reg109@captiveaire.com">reg109@captiveaire.com</a>
Captive-Aire Systems	Primary Contact: Ethan Kemper, (636) 334-9962, <a href="mailto:Ethan.Kemper@captiveaire.com">Ethan.Kemper@captiveaire.com</a> First Alternate Contact: Mike Little, (636) 229-9777, <a href="mailto:reg109@captiveaire.com">reg109@captiveaire.com</a>
Chase Doors (a Seneca Company)	(800) 543-4455, X8989 or Direct: (216) 282-3328.
Comco Systems	Caryssa Heath, (800) 533-3794 x226 or (940) 465-4007, <a href="mailto:cheath@comcosystems.com">cheath@comcosystems.com</a>
Concept Store Fixtures (CFS International)	Mike Lyons, (704) 340-8993, <a href="mailto:mlyons@conceptfixtures.com">mlyons@conceptfixtures.com</a>
Copeland Cold Chain LP	Customer Service/Parts Ordering: (800) 829-2724. Manufacturing Support/Return Material Dept: (800) 829-2724 Technical Support: (479) 845-3430 Application Engineer: Samuel Adam, (479) 544-5339, <a href="mailto:Samuel.Adam@Copeland.com">Samuel.Adam@Copeland.com</a> Application Engineer: Doug Crawford, (479) 381-8377, <a href="mailto:Doug.Crawford@Copeland.com">Doug.Crawford@Copeland.com</a> Account Manager: Brad Kyle, (414) 218-1675, <a href="mailto:Brad.Kyle@Copeland.com">Brad.Kyle@Copeland.com</a>
Crown Tonka-Everidge	(800) 523-7337, <a href="mailto:sales@crowntonka.com">sales@crowntonka.com</a>
Danfoss	BAS: Technical and Start-Up Contacts: Danfoss Walmart Support Team, (479) 204-9085, (800) 339-0405 Application Engineer: Randall McDarison, (262) 215-1389, <a href="mailto:RandallMcDarison@Danfoss.com">RandallMcDarison@Danfoss.com</a> Account Manager: Jeremy Angel, (443) 449-1975, <a href="mailto:Jeremy.Angel@Danfoss.com">Jeremy.Angel@Danfoss.com</a> REFRIGERATION: Components and Controls: <a href="mailto:WmtDfsSt@walmart.com">WmtDfsSt@walmart.com</a>
DH Pace, Inc.	Mark Lyons, (417) 831-5585 <a href="mailto:walmartdoors@dhpace.com">walmartdoors@dhpace.com</a>
DORMA USA	Lena A Hall, (800) 677-9848.
DuraServ Corp	Steel Doors and Frames/ Recycled Plastic Interior Man Doors: -Josh Hendrix, <a href="mailto:josh.hendrix@duraflexdoors.com">josh.hendrix@duraflexdoors.com</a> Composite Sectional Overhead Doors: -Accounts Manager: Phillip Dailey, (817) 559-0560, <a href="mailto:pdailey@southerndock.com">pdailey@southerndock.com</a> Loading Dock Equipment: -(800) 994-2361 Heath McLain, <a href="mailto:heath.mclain@duraservcorp.com">heath.mclain@duraservcorp.com</a>
Dynamic Closures	(800) 663-4599, ext. 244
Ellis Steel Company, Inc	Account Projects Management (662) 494-5955 (General). Contact Jesse Young, <a href="mailto:jesse.young@ellissteel.com">jesse.young@ellissteel.com</a> (662) 524-3503 (Direct).



EVO Door and Window	Camron Irwin, (561) 714-3459 <a href="mailto:cirwin@evodw.com">cirwin@evodw.com</a> Brent Rosen, (913) 226-3779 <a href="mailto:Brent.rosen@allegion.com">Brent.rosen@allegion.com</a>
GE Lighting Solutions	Walmart GE Project Team. (866) 671-3992, Ext. 2, <a href="mailto:walmart_indoor@currentlighting.com">walmart_indoor@currentlighting.com</a>
Graybar	Jared Wood or Justin Cloer <a href="mailto:jared.wood@graybar.com">jared.wood@graybar.com</a> <a href="mailto:Justin.Cloer@graybar.com">Justin.Cloer@graybar.com</a>
Haines, Jones & Cadbury	Customer Service: (800) 459-7099 Fax: (479) 756-8998 <a href="mailto:WMT@hjcinc.com">WMT@hjcinc.com</a>
Hamilton Security Solutions (a Gunnebo Company)	Cynthia Aceves, (513) 874-3733 or (513) 882-7948, <a href="mailto:Cynthia.aceves@gunnebo.com">Cynthia.aceves@gunnebo.com</a>
Hendee Enterprises Inc.	(800) 231-7275. Contact: Crystal Genovese, <a href="mailto:walmart@hendee.com">walmart@hendee.com</a> (713) 796-6119
Hill Phoenix	Refrigeration Cases: <a href="mailto:BMcFarlane@dovertfoodretail.com">BMcFarlane@dovertfoodretail.com</a>
Hobart Service	Christine Trowbridge, Customer Service Rep III, (918) 252-0515 (O) or (918) 625-7873 (M), <a href="mailto:christine.trowbridge@hobartservice.com">christine.trowbridge@hobartservice.com</a>
Honeywell Multisite (Novar)	General Inquiries/Customer Service/Parts Ordering: (800) 341-7795 Technical Support: (479) 204-3135 Application Engineer: Peter Ritz, (479) 254-7437 <a href="mailto:Peter.Ritz@Honeywell.com">Peter.Ritz@Honeywell.com</a> Account Manager: Edmund Curran, (479) 254-7461, <a href="mailto:Edmund.Curran@Honeywell.com">Edmund.Curran@Honeywell.com</a>
Hussman	Refrigeration Systems and Components: <a href="mailto:WalmartLogistics@hussmann.com">WalmartLogistics@hussmann.com</a> (816)-564-3940. Refrigeration Cases: <a href="mailto:WalmartLogistics@hussmann.com">WalmartLogistics@hussmann.com</a> (314)-713-7858
idX Corporation	Cedar Hill, TX; Attn: John Morehead (740) 969-0004, <a href="mailto:john.morehead@idxcorporation.com">john.morehead@idxcorporation.com</a>
Killion	Refrigeration Cases: <a href="mailto:PaulB@killionindustries.com">PaulB@killionindustries.com</a> (607)-749-5039
KPS	Global Insulated Panel Systems: Fort Worth, TX, (800) 633-3426, <a href="mailto:info@kpsglobal.com">info@kpsglobal.com</a> Refrigeration Components: <a href="mailto:Walmart.WalkIns@kpsglobal.com">Walmart.WalkIns@kpsglobal.com</a>
Kysor/Warren	Refrigeration Systems, Components, and Controls: <a href="mailto:WalmartTeamKW@kysorwarren.com">WalmartTeamKW@kysorwarren.com</a>
Lennox, Inc.	Account Manager (Main Point of Contact): Brad Smith, Strategic Account Manager, (757) 394-1064, <a href="mailto:brad.smith@lennox.com">brad.smith@lennox.com</a> . Technical and Warranty Consultants: National Accounts Technical Support Consultant, (866) 659-0756, <a href="mailto:nationalaccountstechnicalsupport@lennoxind.com">nationalaccountstechnicalsupport@lennoxind.com</a> Startup and Commissioning Managers: - Dedicated Owner's Technical, Pre Start, Commissioning Managers, <a href="mailto:EOC@LennoxNAS.com">EOC@LennoxNAS.com</a> - Lennox NAS EOC/Guided Startup, <a href="mailto:EOC@LennoxNAS.com">EOC@LennoxNAS.com</a> . Unit Selection and Application Support: (888) 595-4962, <a href="mailto:CAS@lennoxind.com">CAS@lennoxind.com</a> . Equipment Quotes, Submittals and Delivery contacts: (888)-595-4369, <a href="mailto:LennoxNationalAccounts@Lennoxind.com">LennoxNationalAccounts@Lennoxind.com</a> , Parts: (800) 906-4427, <a href="mailto:LNXNationalAccountParts@Lennoxind.com">LNXNationalAccountParts@Lennoxind.com</a>
Liebert, a Vertiv Company	(800) 543-2378.
LOEB ELECTRIC	<a href="mailto:emily.morris@loebelectric.com">emily.morris@loebelectric.com</a> (614) 358-4979 Emily Morris.
LSI Industries	(800) 436-7800. Contact Vanessa Thornbery, (513) 846-7192, <a href="mailto:vanessa.thornbery@lsicorp.com">vanessa.thornbery@lsicorp.com</a>
McCue Corporation	Kaitlyn Roaf, (800) 800-8503, <a href="mailto:kroaft@mccue.com">kroaft@mccue.com</a> or <a href="mailto:cservices@mccue.com">cservices@mccue.com</a>
McGee Corp	<a href="mailto:walmart@mcgeecorp.com">walmart@mcgeecorp.com</a> ; Carlos Raya (800) 526-5589, mobile (980) 721-1936
Mettler Toledo	Grace Chiam, National Accounts Manager, (614) 203-0705, <a href="mailto:grace.chiam@mt.com">grace.chiam@mt.com</a>
Mueller Door Company	(815) 385-8550
Munters	Start Up Contact: James Kendall (210) 241-8792 <a href="mailto:James.Kendall@Munters.com">James.Kendall@Munters.com</a> Ship Contact / Drawings: Kurt Podschine (210) 784-6648 <a href="mailto:Kurt.podschine@munters.com">Kurt.podschine@munters.com</a> Warranty Contact: Michael Cashin (210) 380-3605 <a href="mailto:Michael.Cashin@munters.com">Michael.Cashin@munters.com</a>
National Cart Co.	(800) 455-3802.
New Millennium Building Systems, LLC.	National Accounts Manager: Josh Bozzi, (260) 321-8118, <a href="mailto:josh.bozzi@newmill.com">josh.bozzi@newmill.com</a>
Overhead Door Commercial	Coiling Counter Doors: - National Accounts Sales Manager: Laura Shemo (800) 972-1730 Overhead Coiling Doors and Sectional Overhead Doors:

	-Accounts Management: (800) 972-1730; Contact Angela Burgess, (469) 549-7121, <a href="mailto:angela_burgess@overheaddoor.com">angela_burgess@overheaddoor.com</a>
QMI Security Solutions	(630) 529-7111 or (800) 446-2500 x 1023. Walmart Sales and Installation manager Karen Thomas ( <a href="mailto:kthomas@qmiusa.com">kthomas@qmiusa.com</a> ).
QualServ Solutions,	Dion Chambers (479) 646-8386 (x310), <a href="mailto:dchambers@qualservsolutions.com">dchambers@qualservsolutions.com</a> ; or Logan Rose (x356)
Quick Tube Systems, Inc (QTS)	Amber Harradine, (832) 717-0549 x101, <a href="mailto:amayes@qtsinc.com">amayes@qtsinc.com</a>
RAE Corp	Refrigeration Systems: <a href="mailto:Jeremy.Colvard@rae-corp.com">Jeremy.Colvard@rae-corp.com</a> (908)-825-7222x111
RavenVolt	Seth McKay or Eric Scanlon <a href="mailto:smckay@ravenvolt.com">smckay@ravenvolt.com</a> <a href="mailto:escanlon@ravenvolt.com">escanlon@ravenvolt.com</a>
Raynor Garage Doors	National Accounts Manager: Ryan Teklinsky, (412) 973-3207 or (800) 628-9528; <a href="mailto:rteklinsky@raynor.com">rteklinsky@raynor.com</a> or <a href="mailto:walmart@raynor.com">walmart@raynor.com</a> (as supplied exclusively by DH Pace Company, Inc., Olathe, KS, Mike Maloney (888) 643-3667, <a href="mailto:walmartdock@dhpac.com">walmartdock@dhpac.com</a> )
REXEL	(479) 751-7123, William Marr, <a href="mailto:William.Marr@rexelusa.com">William.Marr@rexelusa.com</a>
Ridg-U-Rack	(866) 479-7225.
SBI Industrial LLC	Contact Long Pham, (972) 284-1250, <a href="mailto:lpham@sbiindustrial.com">lpham@sbiindustrial.com</a>
Scotsman Ice	Refrigeration Cases: <a href="mailto:Kurt.Mueller@scotsman-ice.com">Kurt.Mueller@scotsman-ice.com</a> (847)-215-4550
SFS USA Holding Inc	TBD
SPX/Recold	Refrigeration System: <a href="mailto:Steve.Klein@spx.com">Steve.Klein@spx.com</a>
Stanley Access Technologies (a division of Allegion Access Technologies , LLC)	Rachael Skuggevik, National Accounts Project Manager, (786) 647-9090, <a href="mailto:rachael.skuggevik@allegion.com">rachael.skuggevik@allegion.com</a>
Starline Holdings, LLC (a Legrand brand)	<a href="mailto:walmart@megreps.com">walmart@megreps.com</a> (501) 821-6200
Won-Door Corporation	National Accounts Sales Manager: Angel Azevedo-Gerber, <a href="mailto:aazevedogerber@wondoors.com">aazevedogerber@wondoors.com</a> (801) 977-2103

## PART 2 - PRODUCTS AND EXECUTION

### SECTION 03531 – ARCHITECTURAL CONCRETE OVERLAYMENT

#### 2.1 OWNER FURNISHED PRODUCTS

- A. Section is shown in this Appendix A only as a placeholder. Owner furnished products and Preferred Flooring Contractor’s (PFC) installation requirements are located in the individual Specifications Section and not in this Appendix A for the sake of consolidation for PFC.

### SECTION 05120 – STRUCTURAL STEEL

#### 2.1 SUPPLIERS

- A. The following are purchased through Owner’s Buyout program. Suppliers are listed in the Owner’s Supplier List for Construction Buyouts in Part 1 of this Appendix.
- B. Description and fabrication of Owner furnished items are as specified in the paragraphs herein.

#### 2.2 SUBMITTALS

- A. Submittal Procedures. Submit all submittals electronically in PDF format via email, unless otherwise specified.
- B. Shop Drawings:
1. Owner's Structural Steel Supplier will prepare shop drawings and forward via email to the Structural Engineer of Record (SER) specified in Specifications Section 01330. The Structural Engineer of Record will review the shop drawings and forward stamped electronic documents to

Owner's Structural Steel Supplier via email. Owner's Structural Steel Supplier will then forward one approved hard copy to Contractor.

2. Shop Drawings will indicate:
  - a. Profiles, sizes, spacing, and locations of structural members, connections, attachments, and fasteners.
  - b. Supplementary parts and members necessary to complete structural steel work, including bolts, gussets, plates, and related items required for assembly.
  - c. Miscellaneous deck support angles required for support of metal deck around columns, gussets, openings, and obstructions.
  - d. Welded connections designated by standard AWS welding symbols, including net weld lengths.
  - e. Top of bearing plate elevations, and elevations above finish floor to the centerlines of embedded plate, anchor bolts, and all control joint locations.
  - f. Substitutions of sections or modifications of details, or both, and reasons for proposal, will be submitted along with shop drawings, clearly identified as such. Accepted substitutions, modifications, and necessary changes in related portions of Work will be coordinated by fabricator.
  - g. Shop drawings will be prepared under the direction of a Professional Structural Engineer registered in the State in which Project is located.
  
- C. Calculations: Submit design calculations for structural steel connections not detailed on Contract Documents or proposed differently than as shown on Contract Documents, signed and sealed by Professional Structural Engineer registered in State in which Project is located. Submit to Architect of Record.

## 2.3 QUALITY ASSURANCE

- A. Welder Qualifications: Qualify welding operators in accordance with Standard Qualification Procedures as required by AWS D1.1.
- B. Comply with applicable provisions of the following specifications and documents:
  1. AISC 303.
  2. AISC 360.
  3. RCSC Specification for Structural Joints Using ASTM A 325 or A 490 Bolts.
- C. Design connections not detailed on Drawings under direct supervision of a Professional Structural Engineer experienced in the design of this Work registered in State in which the project is located.

## 2.4 DELIVERY, STORAGE, AND HANDLING

- A. Product Delivery: Deliver products to Site for Contractor to receive on delivery date established by Contractor. To establish product delivery date, contact the Owner's Account Contact person indicated immediately upon notice of Award of Contract.
- B. Product Packaging: Ship steel with identification markings on each component or package. Identification markings will coordinate with identification markings for components indicated on Owner's Structural Steel Supplier setting drawings.
- C. Acceptance at Site: Contractor to receive products as specified in Specifications Section 05120.
- D. Manufacturing Defects: Contractor to report suspected product manufacturing defects to Owner's Construction Manager and Owner's Structural Steel Supplier. Upon notification, Owner will arrange for repair of product manufacturing defects.

## 2.5 PRODUCTS

- A. Owner's Structural Steel Supplier will furnish structural steel components as follows for installation by Contractor.
  1. Roof framing other than joists, joist girders, and bridging.
  2. Exterior canopy framing other than joists and bridging, including deck bearing support material.
  3. Columns, base plates, and anchor bolts, except items specifically listed in Specification Section 05500.

4. Vestibule framing tubes, angles, and channels.
5. Frames for rooftop HVAC units, compressor racks, refrigeration equipment, exhaust fans and roof openings larger than 10 inches by 10 inches (except as shown on Drawings).
6. Angle for field fabrication of frames for openings larger than 10 inches by 10 inches and not shown and sized on Drawings.
7. Framing for rooftop refrigeration equipment.
8. Framing for roof hatch.
9. Support plates and angles with anchor studs, sleeve anchors, expansion bolts, or adhesive anchors, which are embedded in, anchored to the face of, or cast into concrete or masonry above finished floor, unless specified as Contractor provided in Specifications Section 05500.
10. Adhesive anchors including, rods, adhesive cartridges, and mixing tubes.
11. Anchor bolts, nuts, and washers required for items included in this Section.
12. Erection bolts, nuts, and washers, including those required for attachment of steel joists and steel joist girders, to items included in this Section.
13. Joist and joist girder continuity angles.
14. Accessories specified below except those specified as Contractor Furnished.
15. Satellite dish support.
16. Framing and anchors required for attachment of the EDC as indicated on Structural Drawings.
17. Shear collector tubes as indicated on Structural Drawings.
18. Lintel framing as indicated on Structural Drawings.
19. Pump room deck bearing material.
20. Hose reel at Auto Center as indicated on Architectural Drawings.
21. Framing required for the reinforcement of existing joists and joist girders as shown on Structural Drawings.
22. Owner's Structural Steel Supplier will furnish setting drawings and directions for installation of anchor bolts and other anchorages furnished under this Section and installed under other Sections.

## 2.6 MATERIALS

- A. Structural Steel:
  1. Wide Flange Steel Shapes: ASTM A 992.
  2. Steel Channels, Angles, Anchor Bolts, Plates and Bars: ASTM A 36.
- B. Hollow Structural Sections: ASTM A 500, Grade C.
- C. Structural Steel Pipe: ASTM A 53, Grade B; ASTM A 500, Grade B; or ASTM A 501 as shown on the drawings.
- D. Bolts, Nuts, and Washers: ASTM A 325 or A 307 as shown on Drawings.
- E. Accessories:
  1. Welding Materials: AWS D1.1; type required for materials being welded or as shown on Drawings. E 7024 electrodes ("Jet Weld" rods) are not permitted; use only "All Position" rods. (7018LH)
  2. Headed Stud Anchors: ASTM A 108, Grades 1010 through 1020, headed-stud type, cold-finished carbon steel; AWS D1.1, Type B.
  3. Adhesive Anchors: Adhesive anchors associated with structural steel specified herein shall conform to requirements specified in Section 05090.
  4. Primer Finish: Alkyd primer ASP-795, gray color, by PPG Commercial Performance Coatings.
- F. Teflon Coated Slide Bearing Pads (not typically required): Furnish one of the following products:
  1. Fluorogold by Slide Bearings LP, Athens, TX (903) 675-8571.
  2. Dura-Slide by [Tobi Engineering](#), Glenview, IL (847) 724-7880.
  3. Type CSA by [Con-Serv, Inc.](#), Georgetown, SC (843) 546-1044.
- G. Some accessory materials are by Contractor and specified in Specifications Section 05120.

## 2.7 FABRICATION

- A. Fabricate and assemble structural steel in shop to greatest extent possible. Fabricate according to AISC 360.

- B. Do not splice structural steel members unless otherwise shown on Drawings.

## 2.8 FINISH

- A. Clean, prepare, and shop prime structural steel members.
- B. Do not paint surfaces in contact with concrete, or surfaces specified to be galvanized.
- C. Galvanized Finish: Minimum 1.25 oz/sq ft zinc (hot-dipped galvanized) coating complying with ASTM A 123. Galvanize the following items:
  - 1. Structural steel angles and plates, exposed to weather and in contact with or embedded in concrete or masonry.
  - 2. Anchor bolts exposed to weather and in contact with or embedded in concrete or masonry.
- D. Primer Finish: Prepare structural steel items scheduled to receive primer finish by SSPC-SP 2 (Hand Tool Cleaning) method. Prime steel with primer finish specified; minimum dry mil thickness of 2 mils. Apply primer finish to the following items:
  - 1. Structural steel items not specified as galvanized.
  - 2. Tire and Battery Storage framing except galvanized wall plates and angles.
  - 3. Garden Center canopy framing except galvanized wall angles.
  - 4. Satellite dish support from bottom of deck to top of support.
  - 5. Exposed rooftop refrigeration and HVAC support framing.

## SECTION 05210 – STEEL JOISTS

### 2.1 SUPPLIERS

- A. The scope of this Section is purchased through Owner's buyout program. Suppliers are listed in the Owner's Supplier List for Construction Buyouts in Part 1 of this Appendix.
- B. Description and fabrication of Owner furnished items is as scheduled in the paragraphs below.

### 2.2 SUBMITTALS

- A. Submittal Procedures: Submit all submittals electronically in PDF format via email, unless otherwise specified herein.
- B. Shop Drawings:
  - 1. Owner's steel joist supplier will prepare shop drawings and forward via email to the Structural Engineer of Record specified in Section 01330. The Structural Engineer of Record will review the shop drawings and forward stamped electronic documents to the Owner's supplier via email. The Owner's supplier will then forward one approved hard copy to the Contractor.
  - 2. Shop Drawings will indicate:
    - a. Standard designations, configuration, sizes, spacing, and locations of joists and joist girders.
    - b. Joist and joist girder loading.
    - c. Bridging, connections, attachments, and cambers.
  - 3. Shop drawings will be prepared under the direction of a Professional Structural Engineer registered in State in which the Project is located.
  - 4. Shop Drawings will be submitted within 3 working days of Contract date.
- C. Qualification Data: Submit Manufacturer qualifications to Architect of Record.

### 2.3 QUALITY ASSURANCE

- A. Fabricator Qualifications: Fabricator certified by SJI to manufacture joists complying with applicable standard specifications and load tables of SJI "Specifications."

## 2.4 DELIVERY, STORAGE AND HANDLING

- A. Product Delivery: Owner's Steel Joist Supplier will deliver products to jobsite for Contractor to receive on delivery date established by contractor. To establish product delivery date, contact the Account Contact person indicated, immediately upon notice of Award of Contract.
- B. Project Packaging: Steel Joists will be shipped in manufacturer's standard packaging with identification markings on each component or package. Identification markings will coordinate with identification markings for components indicated on Owner's Steel Joist Supplier installation shop drawings.

## 2.5 MATERIALS

- A. Open Web Joist Members: In accordance with SJI Standard Specifications.
  - 1. SJI Type K Open Web.
  - 2. SJI Type H Open Web.
  - 3. LH Longspan.
  - 4. DLH Longspan.
  - 5. Joist Girders.
- B. Bridging: ASTM A 36, ASTM A 242, A 570, or A 572.
- C. Primer: SSPC - Paint 15, gray.
- D. Anchors and Fasteners:
  - 1. Bridging bolts and joist to girder bolts.
  - 2. Clips for bridging wall anchors.
  - 3. Bolts, nuts, and washers for fastening joists to structural steel components will be furnished in accordance with Section 05120.

## 2.6 FABRICATION

- A. Steel joists and joist girders will be fabricated in accordance with SJI Standard Specifications including headers and other supplementary framing. Top and bottom chord extensions will be furnished where indicated on Drawings.
- B. Joists, joist girders, and accessories will be prepared and shop primed with one coat of primer, minimum dry film thickness of 1.0 mils.
- C. Fabrication Testing and Inspection:
  - 1. Testing and inspection will be performed under provisions of Section 01450.
  - 2. Fabrication of joists and joist girders is subject to inspection and testing.

## **SECTION 05300 – METAL DECK**

### 2.1 SUPPLIER

- A. The scope of this Section is purchased through Owner's buyout program. Suppliers are listed in the Owner's Supplier List for Construction Buyouts in Part 1 of this Appendix.
- B. Description and fabrication of Owner furnished items is as scheduled in the paragraphs below.

### 2.2 SUBMITTALS

- A. Submittal Procedures: Unless otherwise specified herein, submit in accordance with procedures specified in Specifications Section 01330. Submit all submittals electronically in PDF format via email, unless otherwise specified, to Architect of Record.

- B. Shop Drawings: Owner's Metal Deck Supplier will prepare shop drawings and provide an electronic copy to Structural Engineer of Record as specified in Specifications Section 01330. Structural Engineer of Record will review the shop drawings and forward stamped electronic documents to Owner's Metal Deck Supplier via email. The Owner's Supplier will forward one approved hard copy to Contractor for submittal to Architect of Record.
1. Shop Drawings will indicate:
    - a. Decking plan, deck profile dimensions, supports, projections, openings and reinforcements, fastening method and installation accessories.
    - b. Locations, types, and sequence of connections.
    - c. Welds by standard welding symbols adopted by AWS.

## 2.3 MATERIALS

- A. Metal Deck, General: Conforming to SDI standards, type, metal gage, and depth as shown on Drawings. Fabricate panels to comply with ANSI/SDI standards.
- B. Metal Roof Deck: Prime painted steel sheet, shop primed with manufacturer's standard baked-on, rust-inhibitive primer in accordance with SDI standards; ASTM A 1008, Classification SS (Structural Steel) or other structural sheet steel or high strength low alloy steel in accordance with SDI standards.
1. Type B, wide rib, grade:
    - a. 22, 20 and 18 gauge: Grade 80 (80 ksi).
    - b. 16 gauge: Grade 33 (33 ksi) minimum.
  2. Primer Color: Grey top side and white bottom sides.
- C. Metal Canopy Deck: G90 zinc coating and shop-primed steel sheet, cleaned, pretreated, and prime painted with manufacturer's standard baked-on, rust-inhibitive primer in accordance with SDI standards; ASTM A 653, Classification SS (Structural Steel) or other structural sheet steel or high strength low alloy steel in accordance with SDI standards.
1. Type B or N, wide rib, grade:
    - a. 22, 20, 18, and 16 gauge: Grade 33 (33 ksi) minimum.
  2. Primer Color: Grey primer top and bottom sides.
- D. Metal Floor Form Deck: G60 zinc coating steel sheet in accordance with SDI standards; ASTM A 653, Classification SS (Structural Steel) or other structural sheet steel or high strength low alloy steel in accordance with SDI standards.
1. Form deck type as shown on Structural Drawings, grade:
    - a. 28, 26, 24 and 22 gage: Grade 60 (60 ksi) minimum.

## 2.4 ACCESSORIES

- A. Side Lap Fasteners: As noted in the Fastener Schedule shown on the Structural Drawings by one of the following suppliers:
1. Self-drilling, self-tapping screws by [ITW Buildex](#), Itaska, IL (800) 323-0720.
  2. Self-drilling, self-tapping screws by [Elco Construction Products](#), Towson, MD (800) 435-7213.
  3. Self-drilling, self-tapping screws by [Hilti](#), Tulsa, OK (800) 879-8000.
  4. Self-drilling, self-tapping screws by [Simpson Strong Tie](#), Pleasanton, CA (800) 999-5099.
- B. Side Lap Fasteners, Quantity: Determine quantity of fasteners based on requirements of Side Lap Fastener Schedule on drawings. At time of receipt, Contractor shall verify quantity of side lap fasteners in accordance with Side Lap Fastener Schedule. If fastener quantity is not in accordance with requirements of Schedule as calculated at time of Contractor's receipt, provide balance of fasteners to Contractor. Subsequent to Contractor's receipt and acceptance of side lap fasteners, additional fasteners are at Contractor's expense.

## 2.5 FABRICATION

- A. Fabricate steel decking in accordance with the SDI standards and AISI, to accommodate the following:
1. Metal Roof Deck and Metal Canopy Deck: Maximum working stress of 0.6 times the yield stress and maximum span deflection of L/240.

- B. Shop Prime Finish: Mechanically clean and apply primer at a minimum dry film thickness of 0.5 mils.

## **SECTION 05500 - METAL FABRICATIONS**

### **2.1 SUPPLIERS**

- A. The scope of this Section is purchased through Owner's buyout program. Suppliers are listed in the Owner's Supplier List for Construction Buyouts in Part 1 of this Appendix.
- B. Description and fabrication of Owner furnished buyout items is as scheduled in the paragraphs below.

### **2.2 MANUFACTURERS**

- A. Owner's Suppliers will furnish products and equipment by one or more of the following manufacturers who are identified below for information only.
  1. Ellis Steel Company, Inc., West Point, MS, (662) 494-5955 (General).
  2. Marco, Ft. Worth TX, (817) 244-8300.
  3. SBI Industrial, LLC, Dallas, TX. (972) 284-1250.
  4. [Concept Store Fixtures \(CSF International\)](#).
  5. [McCue Corporation](#).

### **2.3 SUBMITTALS**

- A. Shop Drawings: Owner's Supplier will submit shop drawings for Owner furnished jib crane and railings for EOR review to verify safety requirement compliance.

### **2.1 MATERIALS**

- A. Materials: Steel components and finishes of items fabricated by Owner's Supplier specified in the SCHEDULE below shall conform to same Material requirements of specification section 05500 for items fabricated by Contractor.

### **2.2 FABRICATION**

- A. Verify dimensions on site prior to shop fabrication.
- B. Fabricate items with joints tightly fitted and secured.
- C. Fit and shop assemble in largest practical sections for delivery to Site.
- D. Grind exposed welds flush and smooth with adjacent finished surface. Ease exposed edges to small uniform radius.
- E. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Use exposed fasteners of type indicated or, if not indicated, Phillips flat-head (countersunk) screws or bolts. Locate joints where least conspicuous.
- F. Supply components required for anchorage of metal fabrications. Fabricate anchorage and related components of same material and finish as metal fabrication, except where specifically noted otherwise.

### **2.3 SCHEDULE**

- A. Interior Stainless Steel Pipe Bollards - Floor Mounted/Bolted. 302 stainless steel with dome top, brushed finish.
  1. Size: Height and nominal diameter as shown on the drawings.
  2. Fasteners: 5/8 inch x 5 inch Titan-HD anchor bolts and socket head set screw.
- B. Interior Galvanized Steel Pipe Bollards -Floor Mounted. 10 gage CRS tubing with rounded cap.
  1. Size: Height and nominal diameter as shown on the drawings.



2. Fasteners: 5/8 inch x 5 inch Titan-HD anchor bolts and socket head set screw.
  3. Finish: Hot dip galvanized.
- C. Interior Galvanized Steel Pipe Bollards –Mounted Inside Freezer. 10 gage CRS tubing with rounded cap.
1. Size: Height and nominal diameter as shown on the drawings.
  2. Finish: Hot dip galvanized.
- D. Diamond Plate Floor Mounted Rail System for refrigerated case protection is specified in Section 10260.

## **SECTION 06065 – PLASTIC MATERIALS**

### **2.1 SUPPLIERS**

- A. The following are purchased through Owner’s buyout program. Suppliers are listed in the Owner’s Supplier List for Construction Buyouts in Part 1 of this Appendix.
- B. Description and fabrication of Owner furnished items is included in the SCHEDULE below.

### **2.2 MANUFACTURERS**

- A. Owner’s Suppliers will furnish products and equipment by one or more of the following manufacturers who are identified below for information only.
1. Ideal Shield, Detroit, MI.
  2. Post Guard, Farmington Hills, MI.
  3. Ultratech International, Inc., Jacksonville, FL.
  4. Parkland Plastics, Inc., Middlebury, IN.

### **2.3 PRODUCTS SCHEDULE**

- A. Plastic Bollard Sleeve: Polyethylene thermoplastic (LDPE or HDPE) molded plastic bollard sleeve:
1. Size: 1/8-inch thickness, straight vertical height 52-in. to fit 4-inch or 6-inch diameter pipe bollards as shown. Total sleeve height above grade 55-in. to 56-in. depending on manufacturer selected. Field verify bollard diameter.
  2. Color: Furnish color shown on Drawings.
    - a. Where gray color is indicated, furnish Canadian Gray by Encore, PMS color 402, or equal by other specified manufacturer.

## **SECTION 06400 - ARCHITECTURAL WOODWORK AND MILLWORK ASSEMBLIES**

### **2.1 SUPPLIERS**

- A. The following are purchased through Owner’s buyout program. Suppliers are listed in the Owner’s Supplier List for Construction Buyouts in Part 1 of this Appendix.
- B. Description and fabrication of Owner furnished items are as specified in the paragraphs herein.

### **2.2 ARCHITECTURAL SLAT WALL PANEL**

- A. Description: As assembled by Owner’s selected supplier. EPVC substrates clad with machine-pressed vinyl to form rigid, preformed panel with linear wood-slat appearance. Dimensions as determined by supplier.
1. Slat wall is a custom architectural panel, fully assembled off project site and shipped as a panel unit by Owner’s supplier.

### **2.3 ARCHITECTURAL LEDGE SYSTEM**

- A. Preassembled Ledge System Description: Components as prefabricated by Owner’s selected supplier. Left, right, and overhead middle pieces clad with protective surfacing and infilled with foam form inserts, for installation at

interior entryways where shown on Drawings. Protective surfacing manufacturer part numbers are provided as follows for information only to Contractor.

1. Surface Material:
  - a. Ledge System at Auto Center: Black: Matte Luxe Noir (Black) by Omnova, Part No. 542113.
  - b. Ledge System at Locations Other than Auto Center: Natural Woodgrain: Rift Oak Natural by Omnova, Part No. 542285.

B. Site built ledge assembly surface material by Contractor is specified in Specifications Section 06424.

## 2.1 VISION CENTER MILLWORK

C. Owner's Vision Center Millwork Countertop: Owner's Vision Center millwork supplier will furnish solid surfacing material meeting ASTM E 84, Class A; USDA approved for incidental food contact and manufactured in accordance with NSF/ANSI 51. Solid surfacing countertop material shall be by [Verona Marble Company](#), Dallas, TX. (214) 435-8553 as follows:

1. Type 2: Santamargherita Series quartz materials by Verona Marble. Solid sheets consisting of quartz aggregates bound together with a matrix of filled plastic resin.
  - a. Finish: Polished.
  - b. Thickness: 3 cm unless noted otherwise on Drawings.
  - c. Countertop Profile: Solid slabs with straight cut edges, top edge eased at exposed front and sides.
  - d. Backsplash Profile: Separate solid units installed on top of counter, size and location per Drawings.
  - e. Colors: As applicable as shown on Drawings:
    - 1) SST6: Istria.
    - 2) SST7: Lyskamm.

D. Vision Center Cabinet Accessories: Furnish cabinet accessories by the manufacturers specified below or equivalent products of same function, style, material, and finish from manufacturers specified above.

1. Vision Center Shelf Brackets:
  - a. Knape and Vogt: #208 Heavy Duty Utility L-Bracket 20 inches, White.
  - b. Knape and Vogt: #208 Heavy Duty Utility L-Bracket 12 inches, White.
2. Metal Support Leg: 3 inches x 29-7/8 inches with leveler.
3. Adjustable Shelf Pin: Hafele #282.40.708 5mm.

## 2.2 MODULAR PHARMACY MILLWORK

A. This Section 06400 includes millwork assemblies. Schedule of components and allocation of responsibility for Owner's Modular Pharmacy Building packages including wall units, ceiling structure, floor finishes, and doors are included in Section 13030 within this Appendix A.

B. Pharmacy Modular millwork systems include the following:

1. Complete Privacy Wall systems, including glazing and glazing accessories, wall base, protective surfacing, laminate top cap, and end guards.
2. Casework for and equipment included in front customer counter equipment, Health Services Room, and Pharmacist's bench and sink.

C. Modular Pharmacy Privacy Wall Glass and Glazing:

1. Glazing included in Privacy Wall assembly is laminated with frosted film interlayer to achieve visual screening and sound transmission class rating (STC) as described in Drawings.
2. Decorative glass film finishes for field or post-factory application on Privacy Wall glazing, where shown, are by Owner.
3. Owner's Option: To achieve Privacy Wall glazing visual and sound attenuating requirements of the jurisdiction, Owner's Modular assembly provider may furnish acid-etched glass, fabrication and type as follows:
  - a. Tempered, acid-etched, ASTM C 1048, Kind FT (Fully Tempered), Condition A (Uncoated), Type I (transparent glass, flat), Class 1 (clear), Quality q3 (glazing select), opaque finish, acid etched one side, by Walker Glass Co., Ltd, (888) 320-3030.

## 2.3 BREAKROOM MILLWORK

- A. Fabricate using following materials for listed surfaces as defined in AWI/AWMAC/WI - Architectural Woodwork Standards.
1. Plastic Laminates and Thermofused Melamine (TFM) panels with woodgrain patterns:
    - a. Grain direction to run vertical on vertical exposed millwork surfaces, including but not limited to cabinet faces, end panels, doors, drawer fronts, dividers and fillers, unless noted otherwise.
    - b. Grain direction to run parallel to face or exposed edges on horizontal surfaces including but not limited to cabinet bottoms, shelving and horizontal partitions.
  2. Exterior Exposed Surfaces (cabinet faces, ends and finished backs, doors, drawer fronts): High pressure or thermoplastic laminate as shown. Colors as indicated on Drawings.
  3. Interior Exposed Surfaces (open shelving storage or shelving areas): Thermofused Melamine (TFM), high pressure laminate, or thermoplastic laminate as shown. Color as indicated on the Drawings.
  4. Semi-Exposed Surfaces (spaces behind doors, drawer boxes): Thermofused Melamine (TFM), high pressure laminate, or thermoplastic laminate as shown. Color as indicated on Drawings.
  5. Concealed Surfaces: Mill option using materials specified in this Section.
  6. Base: 3/4" plywood or 2x wood blocking as indicated on Drawings.
  7. Hardwood Edge Trim: Solid hardwood, optional species, for countertop edges as indicated on Drawings.
  8. Panel Product Substrate for Laminate Clad Casework: Medium Density Fiberboard (MDF) or Particleboard as specified in Panel Product paragraph above.

## 2.4 MILLWORK, GENERAL – COMPONENT AND ACCESSORY MANUFACTURERS

- A. Manufacturers – Casework Components: Verify products used in the casework assembly are as follows.
1. High Pressure Laminate (HPL): By one of the following as specified in the Color/Pattern Schedule below:
    - a. Formica Corporation; Indianapolis, IN, (800) 729-8956.
    - b. Panolam Surface Systems and its subsidiaries Nevamar Decorative Surfaces and Pionite Decorative Surfaces, Shelton, CT. Contact: John Trulock, (407) 618-3732, [john\\_trulock@panolam.com](mailto:john_trulock@panolam.com).
    - c. Wilsonart; Temple, TX; Contact: Brynn Bishop, (720) 346-4538.
  2. Thermofused Melamine Panel (TFM): Furnish products by one of the following manufacturers:
    - a. Panolam Surface Systems, Shelton, CT. Contact: John Trulock, (407) 618-3732, [john\\_trulock@panolam.com](mailto:john_trulock@panolam.com).
    - b. [Funder America, Inc.](#), Mocksville, NC (336) 751-3501.
    - c. [Roseburg Forest Products](#), Springfield, OR (800) 245-1115 or (541) 679-3311.
  3. Panel Products (MDF and Particleboard): Furnish products by one of the following manufacturers:
    - a. Arauco North America, Atlanta, GA, (800) 261-4890.
    - b. Georgia Pacific Building Products, Atlanta, GA, (800) 284-5347.
    - c. Homasote, West Trenton, NJ, (800) 257-9491.
    - d. [Roseburg Forest Products](#), Springfield, OR (800) 245-1115 or (541) 679-3311.
- B. Accessories:
1. Metal trim:
    - a. [M-D Building Products](#) (Macklanburg-Duncan), Oklahoma City, OK (800) 654-8454.
    - b. Outwater Plastics Industries, Inc.
      - 1) East Coast: Bogota, NJ (800) 631-8375.
      - 2) West Coast: Phoenix, AZ (800) 248-2067.
    - c. [Stylmark, Inc.](#), Fridley, MN (800) 328-2495.
- C. Adhesives:
1. Wilsonart; Temple, TX; Contact: Marty Click (214) 502-4084.
  2. ITW Polymers Sealants North America, Irving, TX, (800) 878-7876.
  3. Franklin International, Columbus, OH, (800) 877-4583.
    - a. At the option of Slat Wall Supplier, Liquid Nails LN-903 Construction Adhesive as an approved alternate.

- D. Manufacturers - Cabinet Hardware and Accessories: Furnish cabinet hardware as specified by the following manufacturers:
1. [Knappe & Vogt](#) (KV), 2700 Oak Industrial Drive NE, Grand Rapids, MI 49505, (616) 459-3311.
  2. [Hafele](#), 3901 Cheyenne Drive, Archdale, NC 27263, (800) 423-3531.
  3. [Ives, 2720 Tobey Drive, Indianapolis, IN 46219, \(877\) 613-8766.](#)
  4. [Rockford Process Control, Inc.](#), 2020 Seventh Street, Rockford, IL 61104, (815) 966-2000.
  5. [Blum, Inc.](#), 7733 Old Plank Road, Stanley, NC 28164, (800) 438-6788.
  6. [Grass](#), 1202 Highway 66 South, Kernersville, NC 27284, (336) 423-5226.

## 2.5 MILLWORK, GENERAL - COMPONENT AND ACCESSORY DESCRIPTIONS

- A. High Pressure Laminate (HPL): NEMA LD3; color, pattern, and finish as indicated in the Laminate Color/Pattern Schedule herein.
1. Exposed Horizontal Surfaces: GP-50.
  2. Exposed Vertical Surfaces: GP-50.
  3. Postformed Surfaces: PF-42.
  4. Thickness: Nominal 0.050 inch thick.
- B. Thermofused Melamine Panel (TFM): Particleboard or medium density fiberboard (MDF) finished with thermally fused, melamine impregnated decorative paper.
- C. Medium Density Fiberboard (MDF): ANSI A208.2, Grade MD, made with binder containing no urea formaldehyde resin.
- D. Particleboard: Density 45 lb., ANSI A208.1, Grade M-2, made with binder containing no urea formaldehyde resin.
- E. Adhesives: Low VOC adhesive, as recommended by laminate manufacturer and suitable for shop or field application.
1. Toxicity / IEQ:
    - a. Comply with applicable regulations regarding toxic and hazardous materials.
    - b. Comply with Green Seal Standard GS-36 for commercial aerosol adhesives.
    - c. Comply with California's South Coast Air Quality Management District (SCAQMD) Rule No. 1168 in areas where exposure to freeze/thaw conditions and direct exposure to moisture will not occur. In areas where freeze/thaw conditions exist or direct exposure to moisture can occur, then comply with California's Bay Area AQMD Regulation 8, Rule 51 for containers larger than 16 oz. and with California Air Resource Board (CARB) for containers 16 oz or less.
  2. Acceptable Products: Furnish the following or equivalent as recommended by laminate manufacturer.
    - a. 3000 Adhesive Series by Wilsonart.
    - b. Sta'-Put SP80 Contact Adhesive as manufactured by ITW.
    - c. Titebond Advanced Polymer Construction Adhesive by Franklin International.
- F. Fasteners: Unless otherwise recommended by the manufacturer, use size and type to suit application; galvanized or stainless for exterior and high humidity locations; plain finish at other locations.
- G. Edge Banding: Edge banding shall be 3 mm thick x 1-5/8 inch strip banding of ABS/PVC composition by Wilsonart, or equivalent.
1. Color: PL-7 as described below.
  2. Color: PL-4 as described below.
  3. Color: PL-31 as described below.
  4. Color: PL-34 as described below.
- H. Cabinet Hardware:
1. Wire Drawer and Door Pulls: ANSI/BHMA A156.9, B02011, solid metal, 4 inches long, 5/16 inch in diameter.
  2. Drawer Slides: ANSI/BHMA A156.9, B05091. Slides shall include an integral positive stop to avoid accidental drawer removal.

- a. Box Drawer Slides: Grade 1HD-100; side mounted; full-extension type; zinc-plated steel ball-bearing slides for drawers not more than 6 inches high and 24 inches wide.
  - b. File Drawer Slides: Grade 1HD-100; side mounted; full-extension type; zinc-plated steel ball-bearing slides for drawers more than 6 inches high or 24 inches wide.
  - c. Pencil Drawer Slides: Grade 1; side mounted; full-extension type; zinc-plated steel or epoxy-coated steel with polymer rollers for drawers not more than 3 inches high and 24 inches wide.
3. Drawer Locks: ANSI/BHMA A156.11, E07041.
  4. Shelf Rests: ANSI/BHMA A156.9, B04013; metal.
    - a. Place rests in drilled 5mm diameter holes, spaced vertically at 1 1/4" centers. Minimum of four rests per shelf.
    - b. Shelf span per AWI/AWMAC/WI standards.
  5. Door Locks: ANSI/BHMA A156.11, E07121.
  6. Frameless Concealed Hinges (European Type): ANSI/BHMA A156.9, B01602, 100 degrees of opening, self-closing.
- I. Cabinet Accessories: Furnish cabinet accessories by the manufacturers specified below or equivalent products of same function, style, material, and finish from manufacturers specified above.
1. Keyboard Tray: Knape and Vogt: 1805 (left and right) 3/4 inch PTBD with Black LPL 2-S.
  2. Grommets:
    - a. Doug Mockett & Company: EDP-3 Round Plastic Grommets, removable caps with flip-down tabs. LO-2 Oval.
      - 1) Size as noted on Drawings.
      - 2) Color as noted on Drawings.
    - b. Hardware Concepts: 6249.
      - 1) Size as noted on Drawings.
      - 2) Color as noted on Drawings.
    - c. Bainbridge Manufacturing: 2 1/2 inch Round 1031BK-52.
  3. Finger Pull (Black): Hardware Concepts.
  4. Cubby Latches: Southco M1-64 Flush Pull Latch, Black, as distributed by Bisco Industries, Inc.
  5. Cubby Hinge:
    - a. Lawson & Shaw: Piano Hinge HGE1000.
    - b. Stocker: Hinge 1-95352475-7200.
    - c. Terry: Hinge CP2-2203S, Nickel/chrome.
  6. Vision Center Door and Drawer Pulls: Taco Metals F50-2876 BKA. Flush Mount 4-3/8 inches x 1-1/4 inches, Black.
- J. Exposed Hardware Finishes: For exposed hardware, furnish finish that complies with ANSI/BHMA A156.18 for BHMA finish number indicated, except where indicated otherwise.
1. Satin Chromium Plated: BHMA 626 for brass base; BHMA 652 for steel base; BHMA 682 for zinc base.
- K. For concealed hardware, furnish manufacturer's standard finish that complies with product class requirements in ANSI/BHMA A156.9.
- L. Stainless Steel Countertop: Furnish 18 Gauge, Grade 304 Stainless Steel sheet with No. 3 finish on 3/4-inch panel particle core substrate in customer view areas where shown on the Drawings. Stainless steel sheet is specified in Section 05500.
- M. Laminate Color/Pattern Schedule: Furnish one color where two or more are specified. Furnish laminate specified below as applicable and as shown/scheduled on the Drawings. All PL designations are for HPL unless otherwise indicated. Colors shown in parentheses are generic color names.
1. PL-1: (Light Gray): Reserved for Sam's Club program.
  2. PL-3: (White): No. 4945-38 Organic Cotton, by Wilsonart.
  3. PL-4 (Maple):
    - a. No. WM791 Hardrock Maple, by Pionite.
    - b. No. 10776HW-60 Kensington Maple, by Wilsonart
    - c. No. W290 Hardrock Maple, by Panolam. (TFM)

4. PL-6 (Light Tan): No. 4143-60 Neutral Glace, by Wilsonart.
5. PL-7 (Medium Brown): No. 96-60 Shadow, by Wilsonart.
6. PL-9 (Dark Gray):
  - a. No. SG228 Slate, by Pionite.
  - b. No. D91-60 Slate Grey, by Wilsonart.
7. PL-11 (Medium Gray):
  - a. No. 928-58 Mouse (matte finish), by Formica.
  - b. No. D90-60 North Sea, by Wilsonart.
8. PL-12 (Gray): No. 4843-60 Mysterd Zephyr by Wilsonart.
9. PL-15: (Brown): No. MKT-001T Golden Iron Moonrock, by Nevamar.
10. PL-20 (Tan): No. 4762HW-60 Mystique Dawn, by Wilsonart.
11. PL-28 (Light Wood): 7939K-18 Blond Echo, by Wilsonart.
12. PL-30: No. 4879 Steel Mesh, by Wilsonart.
13. PL-31: No. 1500-60 Grey, by Wilsonart.
14. PL-32: VA2002 Vision Vava, by Nevamar.
15. PL-33: (Black): Reserved for Sam's Club program.
16. PL-34: No. D354 Designer White by Wilsonart.

N. Substitutions: Not permitted.

## SECTION 06424 – PROTECTIVE SURFACING

### 2.1 SUPPLIER

- A. The scope of this Section is purchased through Owner's buyout program. Suppliers are listed in the Owner's Supplier List for Construction Buyouts in Part 1 of this Appendix.
- B. Description and fabrication of Owner furnished items are as specified in the paragraphs herein.

### 2.2 MANUFACTURERS

- A. Owner's Suppliers will furnish products and equipment by one or more of the following manufacturers who are identified below for information only.
  1. Rigid Sheet Wall Covering:
    - a. Construction Specialties National Accounts, Kennesaw, GA. (888) 424-6287.
    - b. Omnova Solutions, Beachwood, OH. (216) 682-7000.
  2. Adhesive:
    - a. Franklin International, Columbus, OH, (800) 877-8543.
    - b. InPro Corporation, Muskego, WI (800) 222-5556.
    - c. Spray-Lock Premium Eco Adhesives, Chattanooga, TN, (423) 305-6151.

### 2.3 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Not less than 5 years' experience in the production of specified product.
- B. Fire Performance Requirements:
  1. Surface Burning Characteristics: Conform to the following in accordance with ASTM E 84.
    - a. Flame Spread: 25 or less.
    - b. Smoke Density: 450 or less.
- C. Impact Strength Requirements:
  1. Tested in accordance with and meets or exceeds the applicable provisions of ASTM F 476.
- D. Chemical and Stain Resistance Requirements:
  1. Tested in accordance with and meets or exceeds ASTM D 1308.

### 2.4 PROTECTIVE SURFACING

- A. Composition:
  - 1. Construction Specialties: Engineered PETG: Polyethylene terephthalate glycol (PETG) PVC-free polyester blend compound, high impact, rigid sheet.
  - 2. Omnova: Rigid polyvinyl chloride (PVC) sheet.
- B. Thickness: As supplied by manufacturer according to color designation below.
- C. Sheet Size: 4 feet by 8 feet or 4 feet by 10 feet as supplied by manufacturer. Verify manufacturer's part designation herein matches intended sheet size.
- D. Texture: Suede.
- E. Color: Colors and part numbers for some suppliers are custom:
  - 1. PS-1: Walmart Blue.
    - a. Construction Specialties Part No. WMWC40ES410S601.
    - b. FS Blue by Omnova, Part No. 539263.
  - 2. PS-3: Brushed Silver. Construction Specialties Part No. CSCW40410378N.
  - 3. PS-4: Glowing Ember. Construction Specialties Part No. CSWC40481234N.
  - 4. PS-5: Fresh Linen. Construction Specialties Part No. CSWC40481233N.
  - 5. PS-6: Butterfield. Construction Specialties Part No. CSWC404101331N.
  - 6. PS-7: Gray Pattern. Furnish one of the following.
    - a. Walmart White Sugar by Construction Specialties, Part No. CSWC40481430N.
    - b. Linen W by Omnova.
  - 7. PS-10: Black: Matte Luxe Noir (Black) by Omnova, Part No. 542113.
  - 8. PS-12: Natural Woodgrain: Rift Oak Natural by Omnova, Part No. 542285.

## 2.5 ACCESSORIES

- A. Adhesive: Owner's Supplier will furnish one of the following as recommended by wall covering manufacturer.
  - 1. Spray-Lock FRP Adhesive, by Spray-Lock Premium Eco Adhesives.
  - 2. Titebond Greenchoice Advanced Polymer Panel Adhesive, by Franklin International.
  - 3. Bond Adhesive, by InPro Corp.
- B. Outside Corner Guards:
  - 1. Wall Covering Manufacturer's High Impact Outside Corner: Color by manufacturer of wall covering to match wall covering panel if not specified herein and unless noted otherwise on the Drawings. Extruded SSM-20 Suede Texture, 4 feet 1 inch long with caps (including retainer and fasteners) as supplied by wall covering manufacturer.
    - a. PS-1 (Walmart Blue).
    - b. PS-3 (Brushed Silver): Construction Specialties Part No. CSSSM204F374N.
    - c. PS-4 (Glowing Ember): Construction Specialties Part No. CSSSM20411234N.
    - d. PS-5 (Fresh Linen): Construction Specialties Part No. CSSSM20411233N.
    - e. PS-6 (Black) Construction Specialties Part No. CSVA20041108N.
  - 2. Wall Covering Manufacturer's Low Impact Outside Corner: VA-200, 4 feet 1 inch long as supplied by wall covering manufacturer.
    - a. PS-1: Construction Specialties Part No. CSVA2004FNT601N.
  - 3. Aluminum Outside Corner Guard: As specified in Section 10260 for the following wall coverings:
    - a. PS-7.
    - b. PS-11.
- C. Wall Covering Manufacturer's Caulk: For inside corners and seams. Color by manufacturer of wall covering to match wall covering panel if not specified herein.

## SECTION 06610 - GLASS FIBER REINFORCED PLASTIC

### 2.1 SUPPLIERS

- A. The scope of this Section is purchased through Owner’s buyout program. Suppliers are listed in the Owner’s Supplier List for Construction Buyouts in Part 1 of this Appendix.
- B. Description and fabrication of Owner furnished items are as specified in the paragraphs herein.

2.2 MANUFACTURERS

- A. Owner’s Suppliers will furnish products and equipment by one or more of the following manufacturers who are identified below for information only.
  1. Crane Composites, Inc, Channahon, IL, (800) 435-0080.
  2. Glasteel, Moscow, TN, (800) 238-5546.
  3. Franklin International, Columbus, OH, (800) 877-4583 (adhesive and sealants only).
  4. Marlite, Dover, OH, (800) 377-1221.
  5. Parkland Plastics, Inc., Middlebury, IN ((800) 835-4110 (adhesive only).
  6. Spray-Lock Premium Eco Adhesives, Chattanooga, TN ((423) 305-6151 (adhesive only).

2.3 FIBERGLASS REINFORCED PANELS (FRP)

- A. Description: Fiber reinforced plastic coated panels, 0.09 inch thick.
- B. Physical Characteristics: Meet the following minimum characteristics:
  1. Flexural Strength: 8,500 psi per ASTM D 790.
  2. Tensile Strength: 5,000 psi per ASTM D 638.
  3. Izod Impact Resistance: 4 ft-lb/sq inch per ASTM D 256.
  4. Surface burning characteristics in accordance with ASTM E 84 for Class C finish:
  5. Flame Spread: Less than 200.
  6. Smoke Density: Less than 450.
- C. United States Department of Agriculture (USDA): Approved for incidental food contact.
- D. Finish: Embossed.
- E. Color: Furnish color specified below as shown on Drawings or equal by other manufacturer specified herein.

Designation	Crane Composites	Glasteel	Marlite
FRP 1	#85 White	WL White	P100 White
FRP 2	#70 Beige	Beige	P106 Beige
FRP 5	#83 Colonial White	Almond	P118 Almond

2.4 ACCESSORIES

- A. Adhesive: Pressure sensitive, low VOC adhesive.
  1. Titebond Greenchoice Advanced Polymer Panel Adhesive, by Franklin International.
  2. C-551 FRP Adhesive by Marlite.
  3. Parkland Panel Adhesive by Parkland.
  4. FRP Spray Adhesive, by Spray-Lock Premium Eco Adhesives.
- B. Wall Trim: Manufacturer’s standard matching wall trim including caps, division bars, inside and outside corners, edge, and other trim as required for a complete and finished installation.
- C. Sealant: Manufacturer's Silicone Construction Sealant.
  1. Product: MS 250 or MS 251 Silicone Sealant by Marlite or equivalent by any listed manufacturer.

**SECTION 07721 - MANUFACTURED CURBS**



- A. The scope of this Section is purchased through Owner's buyout program. Suppliers are listed in the Owner's Supplier List for Construction Buyouts in Part 1 of this Appendix.
- B. Description and fabrication of Owner furnished items are as specified in the paragraphs herein.

## 2.5 SUBMITTALS

- A. Calculations and Design Drawings: Owner's Supplier will submit calculations and design drawings for Owner furnished curbs showing calculations for seismic loading for each size curb for each different size and type of roof top equipment. Supplier will submit to Architect of Record for EOR review to verify seismic requirements and compliance. Calculation shall be signed and sealed by Professional Structural Engineer registered in State in which Project is located.

## 2.6 MATERIALS

- A. Sheet Steel: One of the following:
  - 1. Galvanized Steel Sheet: ASTM A 653, SS (Structural Steel) Classification, Grade 33, G60 hot-dip zinc coating.
  - 2. Aluminum-Coated Steel Sheet: ASTM A 463, SS (Structural Steel) Classification, Grade 33, Type 2, T2 100 aluminum coating.
  - 3. Aluminum Zinc Alloy-Coated Steel Sheet (GAVALUME): ASTM A 792, AZ55 aluminum zinc alloy coating.
- B. Board Insulation: Specified in Specifications Section 07500/07530.
- C. Wood Nailers: CCA Pressure Treated Lumber Type C, "Standard" grade lumber of any species.
- D. Zinc-Rich Primer: SSPC-Paint 20 Type II.
- E. Deck Support Clip: Galvanized steel sheet.
- F. Coatings: Verify coatings as approved and suitable to project AHJ.
  - 1. Primer and/or Finish Coat: Speedhide Series by PPG.

## 2.7 STRUCTURAL ROOF CURBS

- A. Fabrication, General: Coated 14 gauge steel sheet curb sections, corners fully mitered and welded; 2 inch by 4 inch (nominal dimension) pressure treated continuous wood nailers mechanically fastened with corrosion resistant fasteners fitted with neoprene sealing washers at 12 inches on center to exterior face of curb. Shop prime welded connections with zinc-rich paint complying with SSPC-Paint 20.
- B. Adapter Curbs: Curbs shall be fully welded and insulated. Blank off open areas not used for supply and return air to prevent air mixing. Construct adapter curbs with the minimum height required to achieve proper airflow. Verify curb type, size, and unit prior to fabrication.
- C. Curb Height: Unless otherwise required by local codes, minimum curb height from top of bar joist to top of curb shall be as specified below but in no case less than 8 inches from top of roof membrane to top of curb:
  - 1. All Rooftop Unit Curbs Unless Otherwise Shown or Specified: 18 inches.
  - 2. Refrigeration Line Curbs: 15 inches.
- D. Reinforce curb sections as required for design loads indicated on Drawings.
- E. Welding: AWS D1.1.
- F. Mechanical unit curbs: Label curbs with "FRONT" designating the curb orientation to the front of store prior to shipment. Mechanical unit curbs will be furnished as follows as applicable:

1. Roof Top Unit (RTU) Curbs: Furnish continuous height rail curbs. It is acceptable for units to follow roof slopes not exceeding 1/4 inch per foot unless noted otherwise on structural drawings.
2. Condensing Unit (CU/RCU) Curbs: Furnish tapered rail curbs. Construct curb for CU/RCU to be level (verify roof slope).

G. Refrigeration Line Curbs and Weather Hood: Furnish continuous height rail curbs. It is acceptable to follow roof slopes not exceeding 1/4 inch per foot, unless noted otherwise on Structural drawings. Furnish curb for required opening for refrigerant piping and electrical conduit. Furnish 18 gauge weather hood sized to fit curb with pre-molded neoprene gasket and closure plates.

H. Shop Painting: Shop finish interior surfaces of curbs including safety screens and hardware kit of items that will be exposed to the public after installation. Use PPG dry fog coating as specified; color to match Sherwin-Williams #SW6385 "Dover White".

## 2.8 WIND/SEISMIC RESTRAINT BRACKETS

A. When noted on the Mechanical Rooftop Unit or Air Handling Unit Schedules, or Refrigeration Drawings, wind and seismic restraint brackets will be furnished by Owner with curbs for anchorage of rooftop equipment to curbs.

## 2.9 ROOF CURB SCHEDULE

A. Structural Curbs: Owner furnished structural curbs and adaptors (if applicable) will be supplied for the following items:

1. HVAC roof top units (RTU).
2. Condensing Unit Curb (RCU and CU).
3. Secondary Skid Curb.
4. Compressor House.
5. Hybrid House.
6. Roof penetrations for Refrigeration lines and electrical conduit.

## SECTION 07900 - JOINT SEALERS

### 2.1 SUPPLIERS

A. Resilient Flooring Sealants: Owner's Preferred Flooring Contractor will furnish and install sealant as specified in Specifications Section 07900 for caulking around columns at resilient flooring.

B. Exterior Wall and Substrate Sealants: Elastomeric exterior sealants listed in this paragraph will be furnished by the Owner through Owner's Facilities Maintenance program. Exterior elastomeric sealant for the listed applications shall be the products of [Sika USA](#) (formerly Master Builders Solutions Construction Systems US), Lyndhurst, NJ, (201) 933-8800. Contact: Kevin Collins, (215) 527-0727, [collins.kevin@us.sika.com](mailto:collins.kevin@us.sika.com).

1. Elastomeric sealants for exterior wall (L1).
2. Elastomeric sealants for concrete sidewalk or paving joint at building where joint filled with PMEJ (L2).

A. Information regarding Master Builders Solutions exterior sealants as described in the following paragraph is for information only to Walmart RSS program.

### 2.2 ELASTOMERIC SEALANTS - GENERAL

A. Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

### 2.3 ELASTOMERIC SEALANTS (EXTERIOR WALL)

A. Furnish Sealant for Exterior Wall Control and Expansion Joint as follows:

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1. L1: Multi Component Sealant (for joint width not exceeding 1-1/2 inch and joint depth not exceeding ½ inch): Non-sag, Class 50. Furnish the following:
  - a. [MasterSeal NP 100](#) by Master Builders Solutions or its corporate partner Sika (contact Sika for Master Builders Solutions equivalent product lines).
  - b. Container Size and Color:
    - 1) Custom Color Sealants: 1.5 Gal Pail.
    - 2) Limestone (Stock Color Gray): 1.5 Gal Pail or 20 oz sausage (not typical for vertical wall).
    - 3) Match adjacent finish color if exterior color scheme is non-prototypical.

#### 2.4 ELASTOMERIC SEALANTS (APPLICATIONS OTHER THAN EXTERIOR WALL)

- A. Elastomeric Sealant for Concrete Sidewalk or Paving Joint at Building (Existing joints only):
  1. L2: Multi-Component Sealant (for joint width not exceeding 3 inches and joint depth not exceeding ½ inch): Non-sag or self-leveling, Class 50: Furnish the following:
    - a. MasterSeal NP 100, by Master Builders Solutions.
    - b. Color:
      - 1) Limestone (Stock Color Gray): 1.5 Gal Pail or 20 oz sausage.
      - 2) Match adjacent finish color if exterior color scheme is non-prototypical.

### SECTION 08110 – STEEL DOORS AND FRAMES

#### 2.1 SUPPLIERS

- A. The scope of this Section is purchased through Owner’s buyout program. Suppliers are listed in the Owner’s Supplier List for Construction Buyouts in Part 1 of this Appendix.
- B. Description and fabrication of Owner furnished items are as specified in the paragraphs herein.

#### 2.2 MANUFACTURERS

- A. Owner’s Suppliers will furnish products by one or more of the following manufacturers who are identified below for information only.
  1. [Adams Rite](#) (an Assa Abloy Company).
  2. Amweld Building Products Division.
  3. [Ceco Door \(an Assa Abloy Company\)](#).
  4. [Curries \(an Assa Abloy Company\)](#).
  5. [Deansteel](#).
  6. [Door Components Inc \(DCI\)](#).
  7. [Hollow Metal Express \(HMX\)](#).
  8. [Mesker](#).
  9. [Metal Products Inc \(MPI\)](#).
  10. [Pioneer Industries \(an Assa Abloy Company\)](#).
  11. [Premier](#).
  12. [Republic](#).
  13. [Security Metal Products \(SMP\) \(an Assa Abloy Company\)](#).
  14. [Steelcraft \(an Allegion Company\)](#).
- B. Pharmacy Door with Coiling Shutter Cutout (if shown): Model WM 3070 as manufactured by [Steward Steel, Inc.](#), Sikeston, MO. (573) 471-2122 or equivalent as manufactured by any of the above named manufacturers.

#### 2.3 QUALITY ASSURANCE

#### 2.4 DOORS

- A. Interior Doors, General: ANSI 250.8, Level 1 and Physical Performance Level C (Standard-Duty), 1-3/4 inches thick, Model 1 (Full Flush) 0.032 min. thickness (20 gage), cold-rolled steel, optional core construction as specified below.

- B. Exterior Doors, General (Non-FL Projects): ANSI 250.11, Level 2 and Physical Performance Level B (Heavy Duty), 1-3/4 inches thick, Model 1 (Full Flush) 0.042 inch min. thickness (18 gage), ASTM A 653, Commercial Steel (CS), Type B, with an A60 zinc-iron-alloy (galvannealed) coating cold-rolled steel, polyurethane or polystyrene foam insulated core construction
  - 1. Fabricate head flush with top edge to exclude water.
- C. Core Construction:
  - 1. Polyurethane core foamed in place or laminated, R=10; 1/2 inch maximum voids in any direction. Strength of bond between core and steel face sheet shall exceed strength of core so delamination will not occur during operating conditions.
  - 2. Rigid core of polystyrene foam board, R=7. Strength of bond between core and steel face sheet shall exceed strength of core so that delamination will not occur under operating conditions.
  - 3. Honeycomb Core: Kraft fiber honeycomb with nominal 1 inch cell size and crush strength of 45 psi.
  - 4. If laminated insulation is used, apply adhesive full coverage to door face.
- D. Interior Pharmacy Door with Coiling Shutter Cutout (if shown): SDI-100; Grade III, Extra Heavy Duty 1-3/4 inches thick, Model 1, Full Flush Design, 16 gage.
  - 1. Fabricate with integral shelf and opening for coiling shutter and with additional reinforcement as shown on the drawings. Shutters are specified in Section 08337. Interior Vision Center Steel Pocket Door: Pocket door, frame, and hardware for door size 3670, furnished as kit from preselected supplier as specified in Section 08710.

## 2.5 FRAMES

- A. Interior Drywall Frames: 0.053 min. thickness (16 gage), cold-rolled steel, mitered welded units.
  - 1. Jamb depth: Sized to fit wall thickness.
- B. Interior Drywall Frames (Hollow Metal Doors only; Retrofit Openings only): 16 gage, cold-rolled steel, mitered knock-down.
  - 1. Jamb depth: Sized to fit wall thickness.
- C. Interior Drywall Frames for Vision Center Steel Pocket Door: As supplied with door kit as specified herein.
- D. Interior Masonry Frames: (16 gage), cold-rolled steel, mitered and welded units.
  - 1. Jamb depth: 5-3/4", unless otherwise indicated on Drawings.
- E. Exterior Frames: (16 gage steel), A60 galvannealed coating (ASTM A 653), mitered and welded units.
  - 1. Jamb depth: 5-3/4", unless otherwise indicated on Drawings.

## 2.6 DESCRIPTION - FRAME ANCHORS

- A. Jamb Anchors:
  - 1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
  - 2. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch thick.
  - 3. Compression Type for Drywall Slip-on Frames: Adjustable compression anchors.
- B. Floor Anchors: Formed from same material as frames, not less than 0.042 inch thick.

## 2.7 ACCESSORIES

- A. Rubber Silencers: Resilient rubber. Specified in Section 08710.

- B. Glazing Stops: Rolled steel channel shape, butted corners. Prepare for countersink style screws, located no more than 2 inches from each end, and spaced no more than 12 inches on center.
- C. Plaster Guards: Furnish 26 gage steel plaster guards or mortar boxes, welded to frame, at back of hardware cutouts in masonry openings.
- D. Mullions For Double Doors: Removable type, specified in Section 08710.
- E. Astragals for Double Doors: Steel, specifically for double doors. For rated pairs of doors, furnish astragal to meet UL rating requirement. If doors which maintain rating without an astragal are furnished, submit door manufacturer's literature indicating UL rating. If U-shaped astragal is used that does not require a coordinator, omit double door coordinator from applicable hardware set in Section 08710.
- F. Board Insulation Blocking: ASTM C578, Type IV (density 1.6 pcf minimum), 1 inch thick. Furnish one of the following:
  - 1. Greenguard Type IV XPS by Kingspan Insulation, (800) 241-4402.
  - 2. Styrofoam Brand Square Edge XPS, by Dupont Performance Building Solutions, Wilmington, DE, (833) 338-7668.
  - 3. Foamular 250, by Owens Corning, Toledo, OH (800) 438-7465.
- G. Door Shelf (Pharmacy Door): Manufacturer's standard full shelf, 16 gage stainless steel, with 2 support brackets each side, width as shown on the drawings. Furnish beveled head sheet metal fasteners for attachment of shelf support brackets to door.

## 2.8 PROTECTIVE COATINGS

- A. Bituminous Coating: Fibered asphalt emulsion, field applied.
- B. Primer: Exposed surfaces shall be cleaned, treated with Bonderite chemical and given one baked-on shop coat of gray synthetic primer.

## 2.9 FABRICATION

- A. Fabricate doors and frames in accordance with ANSI A250.8.
- B. Transom Bars: Fixed type, of same profiles as jamb and head.
- C. Fabricate doors with hardware reinforcement welded in place.
- D. Furnish weep-hole openings in bottom of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.
- E. Fabricate frames with hardware reinforcement plates welded in place. Furnish mortar guard boxes.
- F. For welded frames, weld face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
- G. Furnish countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
- H. Fabricate frames to suit masonry wall coursing with 4 inch head member.
- I. Silencers: Prepare frames for silencers.
  - 1. Single Doors: Furnish 3 single rubber silencers on strike side.
  - 2. Double Doors with Mullions: Furnish 3 single rubber silencers on each door, on strike side.
  - 3. Double Doors Without Mullions: Furnish 2 single silencers on frame head.
  - 4. Do not install silencers until frames have received their final finish coat.
- J. Fire Rated Doors:

1. Attach fire rated label to each door and each frame unit. Do not paint over labels.
  2. Cut-outs may be made to existing rated doors for the installation of rated glazing, provided work is done in an approved shop. Site modifications of rated doors will not be allowed.
- K. Where multiple openings are indicated, fabricate double wide frames of material gauge as scheduled. Joint frames at swing jamb using minimum 16 gauge insert spline connection full length. After assembly, fill joint with epoxy filler, allow to harden, and finish smooth and flush.
1. Fabricate impost base anchor, providing for minimum of two (2) anchors per impost. Base shall fit impost inside profile with "force fit."

## **SECTION 08150 - RECYCLED PLASTIC INTERIOR MAN DOORS**

### **2.1 SUPPLIERS**

- A. The scope of this Section is purchased through Owner's buyout program. Suppliers are listed in the Owner's Supplier List for Construction Buyouts in Part 1 of this Appendix.
- B. Description and fabrication of Owner furnished items are as specified in the paragraphs herein.

### **2.2 RECYCLED PLASTIC DOORS**

- A. Interior Doors: Manufacturer's Standard-Duty, 1-3/4 inches thick, Model 1 (Full Flush). Tested to the standards of ASTM E84.
  1. Construction: Two extruded sheets of recycled high density polyethylene (HDPE) bonded to panel on both sides, horizontally routed on interior sides, through-bolted.
  2. Color: Color integrally extruded according to manufacturer's standard extrusion process to match P162. Field finishing not required.
  3. Cycle Performance: Minimum 2,000,000 cycles.
  4. Interior Construction: Two full-height pultruded fiberglass stiffeners inserted in vertical slotted grooves of flush panels.
  5. Exposed Bolt Hardware: As specified herein. Factory prefinished to match door panel color.
  6. Door Color: Match P162 #7674 Peppercorn by Sherwin Williams.
- B. Door and frame assembly supplied shop-fit and assembled as unit.
- C. Interior Vision Center Pocket Door: Pocket door, frame, and hardware for door size 3680, furnished as kit from Owner's HDPE door supplier as specified in Section 08710.

### **2.3 DOOR FRAMES, VISION FRAMES, AND ACCESSORIES**

- A. Interior Drywall Frames: 0.053 min. thickness (16 gage), cold-rolled steel, mitered welded units.
  1. Jamb depth: Sized to fit wall thickness.
  2. Do not use knock-down frames with HDPE man doors.
- B. Interior Drywall Frames for Vision Center Steel Pocket Door: As supplied with door kit as specified herein.
- C. Interior Masonry Frames: (16 gage), cold-rolled steel, mitered and welded units.
  1. Jamb depth: 5-3/4", unless otherwise indicated on Drawings.
- D. Door Jamb Anchors:
  1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
  2. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch thick.
  3. Compression Type for Drywall Slip-on Frames: Adjustable compression anchors.

- E. Floor Anchors: Formed from same material as frames, not less than 0.042 inch thick.
- F. Metal Vision Light Frames: Manufacturer's standard 18 gauge galvanized steel sheet, with factory baked enamel finish.
  - 1. Metal Frame Color: To match door face.
  - 2. Vision Light Size: As indicated on Drawings.
- G. Door Shelf (Pharmacy Door): Manufacturer's standard full shelf, 16 gage stainless steel, with 2 support brackets each side, width as shown on the drawings. Furnish beveled head sheet metal fasteners for attachment of shelf support brackets to door.

#### 2.4 DOOR HARDWARE

- A. Owner's Supplier will furnish plastic door assembly prepared to receive templated hardware.
  - 1. Doors and frames reinforced to receive non-templated, mortised, and surface-mounted door hardware.
- B. Hardware Designations for HDPE Doors: Door hardware part numbers, types, and designations as required for Owner furnished HDPE man doors are located in Specifications Section 08710 (Base).
- C. Hardware groups or sets for HDPE doors are located in 08710 Owner Furnished SCHEDULE. Hardware groups or sets for HDPE doors identical to groups or sets specified for equivalent Hollow Metal doors unless noted otherwise.
- D. Remote Access Control (where door is scheduled to receive Remote Access Control Card Reader):
  - 1. Ingress and egress control to be wired to wall mounted card readers.
  - 2. Remote Card Reader Power Requirements: Dedicated 120V AC 5 Amp, 60 Hz, single phase power with solid earth ground connection.

### SECTION 08305 – SIDE FOLDING GRILLE

#### 2.1 SUPPLIER

- A. The scope of this Section is purchased through Owner's buyout program. Suppliers are listed in the Owner's Supplier List for Construction Buyouts in Part 1 of this Appendix.
- B. Description and fabrication of Owner furnished items are as specified in the paragraphs herein.

#### 2.2 ROD AND LINK STYLE SIDE FOLDING GRILL

- A. Components:
  - 1. Curtain Panel: 4-1/4 inches wide with 2 inch high bottom and 2 inch high top plates of truss like aluminum. Panels shall be connected with 1/8 inch by 5/8 inch by 4-1/4 inch aluminum links onto 5/16 inch aluminum rods spaced 15 inches apart by 1/2 inch aluminum tubes.
  - 2. Pattern: Straight.
  - 3. Aluminum vertical rods with high impact extruded polymer (HIEP) sleeves and aluminum and horizontal links.
  - 4. Extruded aluminum overhead track, 1-3/8 inches wide by 1-3/4 inches high, with continuous extruded profile seamed together by alignment bars and track pins. Track shall accept 1 1/8 inch nylon trolleys and carry weight of complete curtain.
- B. Locking:
  - 1. Single Closure: Furnish locking wall channel and intermediate posts concealing mortise type lock cylinder and knob activating steel drop bolts into floor sockets as standard with the manufacturer.
  - 2. Bi-Parting Grille: Furnish intermediate posts concealing mortise type lock cylinder and knob activating steel drop bolts into floor sockets. Bi-part posts at midpoint as standard with the manufacturer.
  - 3. Furnish keyed cylinders as standard with the manufacturer.

- 4. Furnish ADA compliant inside thumbturn at entry grille with tighter link spacing around lock to prevent outside operation of thumbturn.
- C. Floor Sockets: Furnish spring loaded, dust proof floor sockets and plates for drop bolts.
- D. Door Pockets: Prefabricated framed pocket designed for 6-inch stud partition installation. Welded 1/2 inch tubular steel frame forming a 6 inch exterior suitable for commercial construction of 6 inch steel stud walls. Interior clear opening width shall be 5 inches. Pocket shall be adjustable to be raised or lowered up to 1 inch. Front of pocket shall have a grey high impact extruded polymer pocket door with magnetic strip full height of pocket door.
- E. Operation: Manual push-pull operation with attached pull straps.
- F. Finish: Manufacturer's standard clear anodized coating.

## **SECTION 08383 - TRAFFIC DOORS**

### **2.1 SUPPLIERS**

- A. The scope of this Section is purchased through Owner's buyout program. Suppliers are listed in the Owner's Supplier List for Construction Buyouts in Part 1 of this Appendix.
- B. Description and fabrication of Owner furnished items are as specified in the paragraphs herein.

### **2.2 FULL-HEIGHT TRAFFIC DOORS**

- A. Description: High impact plastic traffic door, gasketed or non-gasketed as shown on Drawings.
- B. Door Panel: U.S.D.A. compliant, solid high density polyethylene panels or non-CFC urethane filled polyethylene plastic sandwich panels with textured surfaces on both sides. Minimum thickness as follows:
  - 1. 8 ft Wide x 9 ft High Openings: 3/4 inch thick panel.
  - 2. All Other Openings: 1/2 inch thick panel.
- C. Gaskets (Seals): Furnish integrated nylon brush or rubber perimeter seal package. Furnish solid gasket seals at food preparation areas as shown on the drawings. Color: Black.
- D. Hardware: Enclosed stainless steel positive-close double acting hinges interconnected by full length powder coated aluminum spline. Color: Black.
- E. Vision Panel: Integrated, non-gasketed 1/4 inch thick polycarbonate. Size: 200 square inch per leaf. Locate bottom of panel to be not more than 43 inches above finished floor.
- F. Jamb Guards: Space saving low profile integrated steel jamb guards. Color: Matte stainless steel.
- G. Impact Bumper: Two-foot height impact absorbing tear drop shaped bumper each side of door.
- H. Door Color: Black.
  - 1. Verify color if required to match an existing to remain interior color scheme.

### **2.3 CAFÉ TRAFFIC DOORS**

- A. Door: High impact café style abbreviated form plastic traffic door.
- B. Door Panel: 1/2 inch thick U.S.D.A. compliant high density polyethylene panels having textured surfaces both side.
- C. Hardware:
  - 1. Hinge: Positive close, gravity type, double acting, enclosed adjustable hinge system.



2. Lock (If Shown at Pharmacy Cabinet Mounted Café Doors Only): Furnish a slide lock by one of the following or an equivalent with the identical specifications by another manufacturer.
  - a. Model No. CL 6010 by Mueller.
  - b. Model No. 101930 by GateLatchUSA.com, Gearhart, OR (888) 235-9242.
    - 1) Material: Stainless Steel.
    - 2) Slide Bolt Minimum Thickness: 5/16 inch diameter.
    - 3) Slide Mounting Bracket Minimum Thickness: 3/32 inch.
    - 4) Slide Throw Minimum: 2 inches.
    - 5) All projections shall have radius edges.
    - 6) Slide Body shall have additional 3/8 inch holes for padlock.
    - 7) Latch shall be affixed to café panel with at least 3 fasteners.
  
- D. Door Color: Black.
  
- E. Hardware Color: Black.
  
- F. Bollard (for Bollard Mounted Café Doors): Steel post with black urethane coated finish.

**SECTION 08462 - AUTOMATIC SLIDING ENTRANCE DOORS**

2.1 SUPPLIER/INSTALLER

- A. The scope of this Section is purchased through Owner's buyout program. Suppliers are listed in the Owner's Supplier List for Construction Buyouts in Part 1 of this Appendix.
  
- B. Description, fabrication, performance, and installation of Owner furnished items are as specified in the paragraphs herein.

2.2 ADMINISTRATIVE REQUIREMENTS

- A. Pre-Installation Conference: Attend pre-installation conference at Site one week prior to commencing Work.
  1. Review foreseeable methods and procedures related to automatic entrance door Work, including the following:
  2. Tour, inspect, and discuss condition of door assembly openings, connections to building structure, electrical requirements, and other preparatory work performed by other trades.
  3. Review automatic entrance door system requirements including drawings, specifications and other contract documents.
  4. Review required submittals, both completed and yet to be completed.
  5. Review and finalize construction schedule related to automatic entrance door Work and verify availability of materials, installer's personnel, equipment and facilities needed to make progress and avoid delays.
  6. Review required inspections, operational testing, and certifying procedures.
  7. Review weather and forecasted weather conditions, and procedures for coping with unfavorable conditions.
  8. Review preparation and installation procedures and coordinating and scheduling required with related work.

2.3 QUALITY ASSURANCE

- A. Installer Qualifications:
  1. Automatic and barrier free door equipment shall be installed by the manufacturer's factory trained installers or shall be installers as recommended and approved by the automatic door operator manufacturer.
  2. Installers shall be certified and recognized by and in accordance with the AAADM Inspector Certification Program.

- B. Windborne-Debris-Impact Resistance: Furnish exterior glazing that passes basic-protection testing requirements in ASTM E 1996 when tested according to ASTM E 1886.
  - 1. Large-Missile Test: For glazing located within 30 feet of grade.
  - 2. Small-Missile Test: For glazing located more than 30 feet above grade.

#### 2.4 PERFORMANCE REQUIREMENTS FOR AUTOMATIC SLIDING ENTRANCE DOORS

- A. System to operate, hold open, and close doors under wind and suction loads calculated by the manufacturer based on the design wind loads shown on the Structural Drawings but not less than a wind load pressure of 20 PSF.
- B. Furnish for dimensional distortion of components during operation.
- C. Furnish for opening and closing operation of door panels in the event of power failure.
- D. Operating Temperature Range: -30 F (Stanley)/ -35 F (dormakaba) to 130 F ambient.
- E. Air infiltration: Maximum air leakage through fixed glazing and framing of automatic sliding doors shall be in accordance with ASHRAE 90.1 for door type and project location.
- F. Eliminate system performance interference by ambient light and radio frequencies.
- G. Furnish sliding doors and side panels with break-away capability where scheduled or shown.

#### 2.5 REGULATORY REQUIREMENTS FOR AUTOMATIC SLIDING ENTRANCE DOORS

- A. Conform to applicable code for automatic release of control drive unit to permit manual opening of doors.
- B. Comply with ANSI A156.10 and ANSI A117.1.
- C. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories, Inc., as suitable for the purpose specified and indicated.

#### 2.6 VESTIBULE AUTOMATIC SLIDING ENTRANCE DOORS (CUSTOMER USE)

- A. Customer Use Vestibule Automatic Bi-Parting Entrance Doors – Exterior: Overhead concealed slide door system with sidelights and transom where indicated, full breakout of doors and sidelights unless otherwise scheduled to be non-breakaway, and doorway monitoring device to control door opening, closing, and hold open functions, single or pair as indicated:
  - 1. Dura-Glide Series 3000 by Stanley.
  - 2. ESA 300 by dormakaba.
- B. Customer Use Automatic Bi-Parting Entrance Doors - Interior: Overhead concealed slide door system with sidelights and transom (interior) where indicated, full breakout of doors and sidelights unless otherwise scheduled to be non-breakaway, and doorway monitoring device to control door opening, closing, and hold open functions, single or pair as indicated.
  - 1. Dura-Glide Series 3000 by Stanley.
  - 2. ESA300 by dormakaba.
    - a. Door and Transom Sizes: As shown on Drawings.

#### 2.7 PICKUP AUTOMATIC SLIDING ENTRANCE DOORS (ASSOCIATE DISPENSE)

- A. Pickup Automatic Bi-Parting Entrance Doors - Exterior: Overhead concealed slide door system and transom where indicated, sliding door panel breakout, and doorway monitoring device to control door opening, closing, and hold open functions.
  - 1. Dura-Guard Series 2000 by Stanley.
  - 2. ESA200 by dormakaba.

## 2.8 OPERATING SYSTEM COMPONENTS

- A. Electromechanical Door Operators: Minimum 1/4 horsepower self-contained overhead unit, permanent-magnet DC motor with gear reduction drive, microprocessor controller; encoder.
1. Operation: Power opening and power closing.
  2. Features:
    - a. Adjustable opening and closing speeds.
    - b. Adjustable open check and close check speeds.
    - c. Adjustable hold-open time between 0 and 30 seconds.
    - d. Obstruction recycle: System reduces door closing speed during next closing cycle after obstruction detected.
    - e. On/Off switch to control electric power to operator.
    - f. Energy conservation switch that reduces door-opening width.
    - g. Closed loop speed control with active braking and acceleration.
    - h. Adjustable obstruction recycle time delay.
    - i. Self-adjusting stop position.
    - j. Self-adjusting closing compression force.
    - k. Onboard sensor power supply.
    - l. Onboard sensor monitoring.
    - m. Optional Switch to open/Switch to close operation.
    - n. Fire alarm interface, configurable to safely open or close the entrance on signal from fire alarm system.
  3. Mounting: Concealed.
  4. Drive System: Synchronous belt type.
- B. Electrical Control System:
1. Electrical Control System: Microprocessor controller and high-resolution position encoder. Encoder to monitor revolutions of operator shaft, send signals to microprocessor controller to define door position and speed.
    - a. High-resolution encoder: Resolution of not less than 1024 counts per revolution. Systems utilizing external magnets and magnetic switches are not acceptable.
    - b. Electrical control system: 24 VDC auxiliary output rated at 1 amp.
  2. Programmable Controller: Microprocessor controller shall be field programmable.
    - a. The following parameters may be adjusted:
      - 1) Operating speeds and forces as required to meet specified ANSI/BHMA standard.
      - 2) Adjustable and variable features specified.
      - 3) Reduced opening position.
      - 4) Fail Safe/Secure control.
  3. Manual programming shall be available through local interface which has a two-digit display with a selection control including three push buttons.
- C. Activation and Safety Controls:
1. Combined Activation and Safety Sensors: Single housing motion and presence detection in accordance with ANSI/BHMA A156.10.
    - a. Motion detected by microwave technology.
    - b. Presence detected by active infrared reflection t.
    - c. Mounting Height: Up to 11.5 feet (3.5 m) above finish floor. One unit center mounted above doorway on each side of housing.
    - d. Temperature Range: Between -31°F and 131°F (-35°C to 55°C) in all environmental conditions
    - e. Relays: Form C, 50V at 0.3A for both activation and safety. Hold time of less than 0.5 seconds.

- f. Detection Pattern: X-pattern activation zone. Entrance opens upon detection in the activation zone, safety zone extends through threshold on each side. Activation and safety zones cleared when entrance closes.
  - g. Motion activation is secondary to knowing act activation.
  - h. Combined motion and presence sensors.
  - 2. Photoelectric Beams: Pulsed infrared type, including sender receiver assemblies for recessed mounting; monitored by electrical controls for faults; fail safe. Minimum of two (2) doorway holding beams in addition to threshold sensor.
  - 3. Presence Sensor Monitoring: Capability for verifying all active presence sensors in accordance with the internal monitoring requirements of ANSI/BHMA A156.10. Detected fault to cease automatic operation until prompted fault is corrected.
- D. Master Control: Programmable, with capability for synchronization with security system.
  - E. Remote Access Control at Auto Center, Pickup Door, and MFC Exterior Dispense Vestibule Doors by Owner's door system Supplier:
    - 1. Owner's door system Supplier will wire wall mounted card readers to ingress and egress control.
  - F. Power Requirements: Dedicated 120V AC, 5 Amp, 60 Hz, single phase power with solid earth ground connection.

## 2.9 DOOR FEATURES, HARDWARE, AND ACCESSORIES

- A. Doors: Narrow stile aluminum doors.
- B. Top Rail: Manufacturer's standard.
- C. Bottom Rail: 10 inches high.
- D. Horizontal Muntins: Furnish two muntins, locate at 24 inches and 42 inches above finish floor. Align with bumper guards and push bars on aluminum storefront system entrance door as indicated on Drawings.
- E. Stiles: 2 inches minimum.
- F. Finish:
  - 1. Exposed Aluminum Surfaces: Architectural Class II anodic coating, AA-M12 C22 A31, conforming to AAMA 611, 0.010 mm minimum thickness. #17 Clear, unless otherwise indicated on Drawings.
- G. Door Hardware and Accessories:
  - 1. Pivots: Sliding panel and sidelights to break away to full open position to provide immediate egress at any point in door movement.
  - 2. Break-away shall be code approved, acceptable to Authorities Having Jurisdiction.
  - 3. Quick disconnect wiring harness.
  - 4. Power Switch: 5 position "On/Off/Hold Open" switch; full automatic, reduced automatic, and exit only.
  - 5. Adjustable door sweeps (exterior doors only).
  - 6. Finger Protection: Furnish finger protection between sidelight and sliding door when door is in open position.
  - 7. Lock:
    - a. Cylinder: Slide doors shall include two point lock securing lead edges of door styles together and to hanger assembly.
    - b. Electric Solenoid Locking System (Exterior Doors): Automatic locking mechanism to secure doors in closed position when the door is closed to outside entry (ENTER/NO). Fail-secure control. Exterior access by key control switch mounted at outside jamb to disengage electric solenoid locking system and open door.
  - 8. Keyed Cylinder (Exterior): Specified in Section 08710 by Contractor.

9. Electric Solenoid Locking System (Exterior Doors): Automatic locking mechanism to secure doors in closed position when the door is closed to outside entry (ENTER/NO). Fail-safe control. Door unit with exterior access by key control switch mounted at outside jamb to disengage electric solenoid locking system and open door.
10. Perimeter pile weatherstripping.
11. Thresholds:
  - a. Furnish aluminum threshold of profile shown for doors when scheduled in Section 08710.
  - b. Furnish edge profile suitable for installation adjacent to entrance tile where applicable.
  - c. Length: Opening width plus 2 inches minimum.
12. Glass Guards (Crash Bars): Nominal 1/2 inch by 2 inch aluminum bar with 1 inch projection from mounting surface. Mounted on doors where and as shown on Drawings.

H. Doors shall be rendered non-breakaway when scheduled on Drawings.

## 2.10 GLASS

- A. Glass shall be type as specified below and conforming to the requirements specified in Specifications Section 08800.
- B. Interior Doors, Sidelites, and Transoms: Clear tempered glass.
- C. Exterior Doors, Sidelites, and Transoms: Tinted tempered glass.

## 2.11 EXAMINATION

- A. Examine existing conditions with Contractor prior to start of door installation.
- B. Examine surfaces and adjacent areas in which Work is performed. Report conditions that may adversely affect satisfactory execution. Do not proceed with Work until unsatisfactory conditions have been corrected.

## 2.12 INSTALLATION

- A. Install products in accordance with manufacturer's published instructions.
- B. Use anchorage devices to securely fasten assembly to adjacent construction without distortion or stress.
- C. Install hardware in accordance with ANSI A117.1 requirements and local adopted disabled access requirements for hardware.
- D. Seal joints between door frames and walls in accordance with requirements specified in Section 07900.

## 2.13 OWNER'S INSTALLER TESTING AND INSPECTION

- A. Site Tests: Upon completion of installation, test operation of automatic entrance doors and operating system. Make all necessary adjustments as required and retest.
- B. Inspection: Inspect automatic entrance doors and operating system installation in accordance with AAADM requirements.
- C. Correct deficiencies in Work which inspection indicates are not in compliance with Contract Documents.

## **SECTION 08710 - DOOR HARDWARE**

### 2.1 REFERENCE TO OWNER FURNISHED DOOR HARDWARE

- A. The scope of this Section is purchased through Owner's buyout program. Suppliers are listed in the Owner's Supplier List for Construction Buyouts in Part 1 of this Appendix.

- B. For the sake of brevity, Owner furnished Hardware Component descriptions and installation are specified in Specifications Section Base 08710 and the accompanying Section 08710 OWNER FURNISHED SCHEDULE, and not duplicated in this Appendix.
- C. Descriptions and installation (if applicable) for door hardware that is furnished by the door manufacturer as part of the Owner furnished door package are located in the same Section within this Appendix A as the door to which the hardware is associated or attached.

## **SECTION 08800 - GLAZING**

### **2.1 REFERENCE TO OWNER FURNISHED GLAZING**

- A. Glass and glazing is not categorically Owner furnished, but is typically Owner furnished when installed within Owner furnished assemblies. Fabrication, type, and salient characteristics of glass materials, glazing compounds, and accessories, as well as quality assurance and execution required for Owner furnished assemblies, are specified in Specifications Section 08800 and not in this Appendix A for the sake of brevity.
- B. Owner furnished assemblies which include glass and glazing are as follows:
  - 1. Owner furnished automatic storefront sliding entrance doors and sidelights as specified in Specifications Section 08462.
  - 2. Owner furnished hollow metal doors and recycled plastic (HDPE) doors are specified in Specifications Sections 08110 and 08150, respectively.
  - 3. Owner furnished Pharmacy privacy walls are specified in Specifications Section 06400.
  - 4. Decorative and security glass film finishes for Owner furnished doors and assemblies are by Contractor and are specified in Specifications Section 08845.

## **SECTION 09310 – CERAMIC TILE**

### **2.1 SUPPLIER**

- A. The scope of this Section is purchased through Owner’s buyout program. Suppliers are listed in the Owner’s Supplier List for Construction Buyouts in Part 1 of this Appendix.
- B. Description and fabrication of Owner furnished items are as specified in the paragraphs herein.

### **2.2 MANUFACTURERS**

- A. Owner’s Supplier will furnish products by the following manufacturers:
  - 1. Crossville Inc., Crossville, TN, (931) 484-2110.
  - 2. Custom Building Products, Santa Fe Springs, CA, (800) 272-8786.
  - 3. Dal-Tile Corporation, Dallas, TX, (214) 398-1411.
  - 4. Pemko (ASSA ABLOY):
    - a. West Coast: Ventura, CA (800) 283-9988.
    - b. East Coast: Memphis, TN (800) 824-3018.
  - 5. Schluter Systems, Plattsburg NY. (800) 267-0817.
  - 6. StonePeak Ceramics, Chicago, IL, (312) 506-2800.

### **2.3 CERAMIC TILE**

- A. Furnish Standard grade tile that complies with ANSI A 137.1 for types, compositions, and other characteristics indicated.
  - 1. CT-45 (White): Wall Tile, 4 x 8:
    - a. WT02, by Crossville.
  - 2. CT-47 (Turquoise): Wall Tile, 4 x 8:
    - a. Color by Numbers Series WT13 Lucky Thirteen, by Crossville.
  - 3. CT-53 (Dark Gray): Floor Tile, 12 x 24:
    - a. Haut Monde Series, HM03 Glitterati Granite, by Daltile.

4. CT-53A (Dark Gray): Tile Base, 6 x 12:
  - a. Haut Monde Series, HM03 Glitterati Granite, by Daltile.
5. CT-53B (Dark Gray): Sanitary Slim Foot Cove Base S3619TN (Cut Top), 6 x 6:
  - a. Color Wheel Collection – Classic, 0780 Matte Chalkboard, by Daltile (Special Order).
6. CT-54 (White): Wall Tile, 4 x 12 Linear:
  - a. Color Wheel Collection, Semi-Gloss Arctic White 0190 (Part No. 0190412mod1p1), by Daltile.
7. CT-55: Place held for Sam’s Club.

#### 2.4 SETTING AND ACCESSORY MATERIALS

- A. Thin-Set Mortar: Multi-use, polymer fortified adhesive mortar for wall installations and as medium bed mortar for flooring installations:
  1. 4-XLT, by Laticrete.
  2. For small scope piece replacements requiring rapid setting, Laticrete 253R polymer fortified rapid set mortar.
- B. Wall Mastic: High tack quick setting latex for installations of wall tile measuring 64 square inches or less. Furnish 3.5 Gal pail by one of the following:
  1. 0015-0035-22 Wall Mastic, by Laticrete.
  2. T1-60 /TDS-190 Tile Adhesive, by Custom.
- C. Grout: SpectraLOCK PRO Grout, by Laticrete.
  1. G-1 (Dark Gray): Platinum #42.
  2. G-2 (Dark Gray), including tile for installation by Preferred Flooring Contractor: Platinum #42.
  3. G-3 (Lt Tan): Parchment #61.
  4. G-4 (Taupe): Dusty Grey #60.
  5. G-7 (Brown): Chestnut Brown #1266.
  6. G-9 (Lt. Gray): Silver Shadow #88 by Laticrete.
  7. G-13 (Beige): Sand Beige #30.
  8. G-15 (Black): Raven #45.
  9. G-16 (Gray): Natural Gray #24.
- D. Grout Cleaning Additive: LATICRETE SpectraLOCK PRO Cleaning Additive.
- E. Floor Leveling Compounds and Primer:
  1. Laticrete NXT Level Plus Self Leveling Underlayment by Laticrete.
  2. NXT Primer for Underlayment by Laticrete.
- F. Building Tape: 25 mil polyethylene backed rubberized adhesive membrane tape.
  1. BT-25XL Building Tape by Proteco Wrap Co.

#### 2.5 TRIM UNITS

- A. Stainless Steel Top and Corner Trim - C: Rondec RO, stainless steel, by Schluter.
  1. Connector: V/RO, stainless steel, by Schluter.
- B. Stainless Steel Vertical Outside Corner Trim: Rondec EV/RO, stainless steel, by Schluter.
- C. Stainless Steel Horizontal Inside Corner Trim: ID/RO, stainless steel, by Schluter.
- D. Stainless Steel Vertical Inside Corner Trim (for 90° corner angle): Dilex EHK U11/011, stainless steel, by Schluter.
- E. Stainless Steel Vertical Inside Corner Trim (for corner angles greater than 90°): Quadec Q 80 EB, by Schluter.
- F. Stainless Steel Corner Guard - A: Specified in Section 10260.
- G. Tile Edge Transition - D: Schluter Schiene, stainless steel, by Schluter.

- H. Stainless Steel Cove Base:
  1. HKUR36E Cove Base, stainless steel, by Schluter.
  2. E/HKUR36E Outside corner, stainless steel, by Schluter.
  3. I/HKU3R36E Inside corner, stainless steel, by Schluter.
  4. V/HKUR36E Connector, stainless steel, by Schluter.
  5. EK/HKUR36E Endcaps, stainless steel, by Schluter.
- I. Stainless Steel Corner Trim - B: One of the following:
  1. ECK-E, 1-1/2 x 1-1/2, E37 V2A110/300, stainless steel, by Schluter.
  2. ECK-K, 1-1/2 x 1-1/2, K32 V2A/200 with anchoring leg, stainless steel, by Schluter.
- J. Stainless Steel Trim Installation Accessories: Schluter ProCut Cutting Wheel #TSM 115/1, by Schluter.
- K. Floor Transition Strips:
  1. Transition edge strip between concrete slab or VCT and ceramic tile (1/4 inch floor tile): No. 8136 by National Guard Products, Inc., or equivalent by Pemko or Reese. 1-1/8"x 1/4" aluminum, smooth surface, beveled 1 side only.
  2. Transition edge strip between concrete slab or VCT and ceramic tile (3/8 – 1/2 inch floor tile): Reno Ramp AERP-125B90 by Schluter Systems, Plattsburgh, NY. 3-1/2" x 1/2" satin anodized aluminum sloped transition ramp.
  3. Transition edge strip between carpet and ceramic tile: Reno-TK by Schluter Systems, Plattsburgh, NY. Anodized aluminum sloped transition ramp with 1/4-inch interior channel.

## 2.6 SETTING AND ACCESSORY MATERIALS

- A. Grout Cleaning Additive: LATICRETE SpectraLOCK PRO Cleaning Additive.
- B. Floor Leveling Compounds and Primer:
  1. Laticrete NXT Level Plus Self Leveling Underlayment by Laticrete.
    - a. NXT Primer for Underlayment by Laticrete.
- C. Sealant: Specified in Section 07900.
- D. Building Tape: 25 mil polyethylene backed rubberized adhesive membrane tape.
  1. BT-25XL Building Tape by Proteco Wrap Co.

## 2.7 MORTAR MIX AND GROUT

- A. Thin-Set Mortar: Multi-use, polymer fortified adhesive mortar for wall installations and as medium bed mortar for flooring installations:
  1. 4-XLT, by Laticrete.
- B. Wall Mastic: High tack quick setting latex for installations of wall tile measuring 64 square inches or less . Furnish 3.5 Gal pail by one of the following:
  1. 0015-0035-22 Wall Mastic, by Laticrete.
  2. T1-60 /TDS-190 Tile Adhesive, by Custom.
- C. Grout: SpectraLOCK PRO Grout by Laticrete.
  1. G-1 (Dark Gray): Platinum #42 by Laticrete.
  2. G-3 (Lt. Tan): Parchment #61 by Laticrete.
  3. G-4 (Gray): Dusty Gray #60 by Laticrete.
  4. G-13 (Beige): Sand Beige #30 by Laticrete.
  5. G-15 (Black): Midnight Black #22 by Laticrete.
  6. G-16 (Gray): Natural Gray #24.



## SECTION 09650 - RESILIENT FLOORING

### 2.1 SUPPLIER

- A. Products in the scope of this Section are purchased through Owner's buyout program and installed by Owner's Preferred Flooring Contractor (PFC).
- B. Owner's Product Suppliers are listed in the Owner's Supplier List for Construction Buyouts in Part 1 of this Appendix. Description and fabrication of Owner furnished items are as specified in the paragraphs herein. Owner's Supplier will supply:
  - 1. LVT/PVC Resilient Flooring.
  - 2. Flooring to Concrete Transition Strip and Fasteners.
  - 3. Flooring Adhesive.

### 2.2 PRODUCTS – LVT/PVC

- A. LVT/PVC Resilient Flooring (Adhered):
  - 1. LVT-1 (Dark Ash Woodgrain): D44 Reclaimed Wood by [Mountville Mills](#), as supplied by HJC. Plank Flooring, 7" x 48" x 1/8" strips, virgin PVC composition.
  - 2. LVT-2P (Light Ash Woodgrain) at Vision Center: Subtractive Layers Collection, Remove Series, Style 1417V, Stone Gray by Patcraft, as supplied by HJC. Nominal 12-in. x 24-in.
- B. LVT/PVC Flooring Adhesive: Schonox VMI 91 Acrylic Adhesive by [Harnix Corp. \(d/b/a/ Linron Company\)](#) or equivalent as supplied by HJC.
- C. Transition Strip from LVT/PVC to Concrete Floor: 2" x 1/8" extruded aluminum transition strip, beveled one edge at 10 degrees, predrilled for fasteners at not more than 12" o.c. Furnish one of the following as supplied by HJC:
  - 1. No. 8132, by National Guard Products, Inc.
  - 2. 2" CTC Reducer by Ceramic Tool Co.
  - 3. Transition Strip Fasteners: Hilti KWIK CON II+, 1/4" x 1-3/4" TFH (1/4" x 1-3/4" Torq Flathead).
  - 4. PVC/VCT Flooring to Concrete Transition Strip at Vision Center 2.0: Extruded aluminum transition strip, stepped underside profile. Furnish the following or equivalent as supplied by HJC
    - a. RT264 Profile by Gradus, Silver Anodized finish.]
- D. Floor Treatment Materials: As furnished and installed by Owner's PFC.
  - 1. Neutral Cleaner: Stride Neutral Cleaner, by SC Johnson Wax Professional.
  - 2. Finish: Signature High Performance UHS Finish, by SC Johnson Wax Professional.

### 2.3 EQUIPMENT BY PREFERRED FLOORING CONTRACTOR

- A. Preferred Flooring Contractor shall furnish labor and equipment for installation of resilient flooring materials. Use of Owner's equipment is not allowed.
- B. Preferred Flooring Contractor shall furnish quantity of equipment required to completely prepare and clean the area designated for each night's work.
- C. Dust extraction system and pre-separator for cleaning slab after surface preparation.
  - 1. Heavy-duty industrial HEPA filtration vacuum system, suitable for extracting and containing large quantities of fine concrete dust (minimum 350CFM air flow) in conjunction with manufacturer recommended pre-separator. Furnish one of the following:
    - a. 86D, by HTC (877) 482-8700 [www.htc-america.com](http://www.htc-america.com).
    - b. T8600, by Ermator LLC (855) 736-2869.
    - c. Bull 1250, by SASE Company, Inc. (800) 522-2606 [www.sasecompany.com](http://www.sasecompany.com).
    - d. Approved equal.

## 2.4 EXAMINATION BY PREFERRED FLOORING CONTRACTOR

- A. Examine surfaces and adjacent areas where products will be installed and verify that surfaces conform to the following requirements for substrate conditions. Do not proceed until unsatisfactory conditions have been corrected.
- B. Verify concrete floors are free of excessive moisture, hydrostatic pressure, alkalinity, scale, and dusting.
- C. Verify concrete floors are plane to tolerances specified in Division 3 specifications.
- D. Verify concrete floors are free from oil, grease, dust, construction debris, loose or scaly paints or coatings, incompatible curing or sealing compounds, and other substances that may impair adhesion of adhesive and finish materials.
- E. Verify that storage conditions specified in Part 1 have been met.
- F. On remodel installations evaluate existing materials for suitability as a substrate.
- G. Beginning of installation indicates acceptance of substrate conditions.

## 2.5 PREPARATION BY PREFERRED FLOORING CONTRACTOR - GENERAL

- A. Cover and protect merchandise and racking to prevent damage or contamination of stored products, and furnish dust drapes as required to protect merchandise from dust or debris. Coordinate sequencing plan for resilient flooring work with Owner's Construction Manager, General Contractor, Store Manager, and Store Planning Field Project Manager to ensure adequate protection is provided in area that work specified herein is performed.
- B. Comply with the requirements of Section 02023.
- C. Remove existing floor tiles as required. Refer to Contract Provisions for demolishing and disposing of tile as referenced in Specifications Section 01351.

## 2.6 PREPARATION BY PREFERRED FLOORING CONTRACTOR - CONCRETE SUBSTRATE

- A. Unless otherwise specified herein, prepare substrate according to ASTM F 710.
- B. Remove paint, oils, waxes, sealers and curing compounds not compatible with adhesive to be used. Do not use organic solvents or liquid adhesive removers.
- C. Prepare concrete substrate to receive adhesive according to flooring manufacturer's written recommendations and as outlined below to ensure adhesion of resilient products.
- D. Preinstallation Bond Test: Conduct bond test of specified floor covering and specified adhesive in accordance with manufacturer's published instructions
- E. Remove ridges, bumps, protrusions, and other irregularities.
- F. Properly prepare expansion joints and fill contraction/construction joints with joint filler or subfloor filler specified in Part 2 of this section as required. Do not seal joints in areas to receive resilient flooring using polyurea or epoxy joint filler specified for concrete slabs in other Sections.
- G. Fill cracks, holes, and depressions with cementitious based underlayment and finish smooth as necessary to achieve a level, flat, hard surface.
- H. Prohibit traffic until filler is cured. Thereafter, unnecessary traffic in work areas shall be kept to a minimum.
- I. Vacuum slab. Use HEPA filtration vacuum system during slab preparation.

## 2.7 INSTALLATION BY PREFERRED FLOORING CONTRACTOR

- A. Begin resilient flooring installation only when slab moisture and pH conditions are satisfactory for placement as determined from results of pre-installation testing.
- B. Install resilient flooring in accordance with manufacturer's published instructions at locations shown.
- C. Open number of floor material cartons to provide quantity required to cover each area; mix pieces within single shade lot to ensure shade variations do not occur within any one area. When working with more than one lot, plan lot placement and location to minimize possible shade differences.
- D. Apply adhesive in accordance with manufacturer's directions. Follow adhesives open time by spreading only enough adhesive to permit installation of floor materials before initial set. Do not spread adhesive for overnight dry.
- E. PVC/LVT Flooring Installation:
  - 1. Install plank flooring in accordance with manufacturer's published instructions. Lay flooring from side-to-side, not front-to-back, of store.
  - 2. Install plank strips with random end-joint offset over entire area. Cut planks in random sizes for starter pieces and alternate the size of the starter piece to avoid a repeating joint pattern. The shortest starter piece shall be not less than 12" and the shortest end run piece shall be not less than 6".
  - 3. Overall plank flooring layout shall produce a complete random appearance of joint spacing with end joints staggered a minimum of 6" apart.
  - 4. Install border as shown on the drawings.
- F. Wipe down bleed-through of adhesive during installation.
- G. Set flooring into place, thoroughly cross roll with a 100-150 pound three-sectional roller before adhesive set time expires to attain full adhesion.
- H. Terminate flooring at centerline of door openings where adjacent floor finish is dissimilar. Where flooring continues through door opening, continue established pattern with no interruption.
- I. Install transition strips at unprotected or exposed edges where flooring terminates.
- J. Set metal transition strips butted to adjacent flooring. Anchor into concrete slab with specified fasteners. Drill concrete with Matched Tolerance Drill Bit for Dense Concrete by Hilti.
- K. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.
- L. Continue flooring under movable type partitions without interrupting floor pattern.

## 2.8 FIELD QUALITY CONTROL BY PREFERRED FLOORING CONTRACTOR

- A. Inspect resilient flooring installation, pattern, layout, and attachment to substrate.
- B. Correct deficiencies in Work which inspection indicates are not in compliance with Contract Documents.

## 2.9 CLEANING BY PREFERRED FLOORING CONTRACTOR

- A. Remove excess adhesive from floor, base, and wall surfaces without damage.
- B. Broom clean resilient flooring after application.
- C. Dispose of construction waste in accordance with the Contract Provisions referenced in Specifications Section 01351.

## 2.10 FLOOR TREATMENT BY PREFERRED FLOORING CONTRACTOR

- A. Examine surfaces and adjacent areas where finishing products will be applied and verify that surfaces conform to product manufacturer's requirements for substrate conditions.
- B. Cleaning and Wax Finish of New Flooring: Furnish floor cleaning and wax finish treatment for areas of new VCT and PVC/LVT installation as follows:
  - 1. Cleaning: Ensure adhesive residues are removed from tile prior to initial cleaning.
    - a. VCT: Dilute neutral cleaner in accordance with manufacturer's instructions. Upon completion of each night's work, clean area of new tile using the diluted neutral cleaner with damp mop or in auto scrubber.
      - 1) Ensure all adhesive residues are removed from tile prior to initial cleaning.
      - 2) Properly dilute neutral cleaner in accordance with manufacturer's instructions.
    - b. PVC/LVT: Dry mop with microfiber mop.
      - 1) Ensure all adhesive residues are removed from tile prior to initial cleaning.
  - 2. Wax Finishing: Apply floor finish in accordance with manufacturer's instructions.
    - a. VCT Tile: Apply two alternating coats of floor finish to floor but do not burnish.
    - b. PVC/LVT Plank Flooring: Apply two light coats of floor finish to floor with a 24" rayon mop in direction of wood grain of plank. Do not burnish.

## SECTION 09655 - RESILIENT BASE AND ACCESSORIES

### 2.1 SUPPLIER

- A. The scope of this Section is purchased through Owner's buyout program. Suppliers are listed in the Owner's Supplier List for Construction Buyouts in Part 1 of this Appendix. Owner's Supplier will furnish the following for installation by Contractor:
  - 1. Rubber or Vinyl Resilient Base (RB).
  - 2. ¼ in. Plastic Base (B).
  - 3. 3/8 in. or 5/8 in. Plastic Base (DB).
  - 4. Sanitary Cove Base (SCB).
- B. Description and fabrication of Owner furnished items are as specified in the paragraphs herein.
- C. Substitutions: Owner's Supplier will comply with the requirements of Section 01600.

### 2.2 REGULATORY REQUIREMENTS

- A. Conform to applicable code for flame/fuel/smoke rating requirements in accordance with ASTM E 84.

### 2.3 RESILIENT BASE

- A. Resilient Base: In accordance with ASTM F 1861, color integrated Type TV (vinyl), TS (rubber, vulcanized thermoset), or TP (rubber, thermoplastic); 1/8 inch thickness unless noted otherwise, approximately 4 inches high. Furnish matching end stops and preformed corner units where required, unless noted otherwise. Verify color prior to ordering.
- B. Resilient Base Accessories:
  - 1. Adhesive: Water resistant type, VOC less than 50 g/l. Furnish GREENchoice Professional Cove Base Adhesive, by Franklin International or equivalent product by another manufacturer.
  - 2. RB1 – Black; RB2 – Black:
    - a. [Armstrong Flooring](#) Vinyl or Rubber: No. 60 Jet Black.
    - b. [Flexco](#) Rubber: No. WF-01 Black Dahlia.
    - c. [Johnsonite \(Tarkett\)](#) Vinyl or Rubber: No. 40 Black.
    - d. [Roppe](#) Vinyl or Rubber: No. 100 Black.
    - e. [VPI](#) Vinyl or Rubber: Jet.

3. RB3 - Blue/Grey:
  - a. Roppe Vinyl: No. 877 Steel Blue.
  - b. Roppe Rubber: No. 75 Slate.
  - c. Johnsonite Vinyl: No. CB-48 Grey.
  - d. Johnsonite Rubber: No. DC-28 Grey.
  - e. Flexco Rubber: No. 14 Medium Grey.
  - f. VPI Vinyl: No. 336 Silver Sable.
  - g. VPI Rubber: No. 736 Silver Sable.
4. RB5 (Vision Center 2.0) – Metallic Gray: [Johnsonite \(Tarkett\)](#): No. 179 Steel, with toe.  
Supplier’s package will not include preformed end stops and corner units, as not used in RB5 installations.

## 2.4 PLASTIC BASE

- A. DuroBase by Parkland Plastics, Inc.
  1. Model: Furnish models specified below corresponding to mark number of base as shown on Drawings:
    - a. B6: ¼ in. x 6 in. x 96 in., Model No. PTX2131P.
    - b. B9: ¼ in. x 4 in. x 96 in., Model No. PTX2137P.
    - c. DB5: 3/8 in. x 5 in. x 144 in., Model No. PTX3135.
    - d. DB6: 5/8 in. x 6 in. x 96 in., Model No. PTX6138P.
    - e. DB10: 3/8 in. x 10 in. x 144 in., Model No. PTX 3133.
    - f. DB11: 5/8 in. x 10 in. x 96 in., Model No. PTX6143P.
  2. Color: Black.
  3. Fasteners: Black flathead countersunk screws, length sufficient to penetrate substrate and metal stud wall framing.

## 2.5 SANITARY COVE BASE AND ACCESSORIES

- A. Base: Antimicrobial plastic, open core construction, standard grade as manufactured by Murphy Construction Co.
  1. Size: As shown.
  2. Edge: As shown.
  3. Finish: Smooth.
  4. Color: As shown on Drawings.
    - a. SCB1 - Red. SCB1 sanitary cove base for quarry tile.
    - b. SCB2 - Grey. SCB2 sanitary cove base for quarry tile.
    - c. SCB4 - Red. SCB4 sanitary cove base for vct/epoxy/concrete.
    - d. SCB5 - Grey. SCB5 sanitary cove base for vct/epoxy/concrete.
    - e. SCB6 - Tan (Mushroom). SCB6 sanitary cove base for quarry tile.
    - f. SCB7 - Tan (Mushroom). SCB7 sanitary cove base for vct/epoxy/concrete.
  5. Special Shapes: Inside and outside corners, splicers, and end caps.
    - a. 90 degree Corners: Shop prefabricated heat welded corners.
    - b. 45 degree Corners: Shop prefabricated heat welded corners.
    - c. Other than 90 and 45 degree Corners: Field fabricated as shown on the drawings.
- B. Accessories:
  1. Button Caps.
  2. Splicers.
  3. Fasteners: As indicated by the manufacturer’s written instructions and as shown on Drawings.
  4. Forstner Bit: 1/2-inch diameter.
  5. Building Tape: 25 mil polyethylene backed rubberized adhesive membrane tape.
    - a. BT-25XL Building Tape by [Proteco Wrap Co.](#)
  6. Adhesive/Sealant: Water resistant type, VOC less than 50 g/L. Furnish one of the following:
    - a. SB 96, by Seal Bond.
      - 1) Color: Gray, red, or tan to match base color.
    - b. Greenchoice Titebond Weathermaster by Franklin International. Color to match base as follows:
      - 1) Gray: Color No. 44741.

- 2) Red: Color No. 44231.
- 3) Tan: Color No. 46381.

## SECTION 09656 – RECYCLED RUBBER COMMERCIAL FLOORING

### 2.1 SUPPLIER

- A. Products in the scope of this Section are purchased through Owner's buyout program and installed by Owner's Preferred Flooring Contractor (PFC).
- B. Owner's Product Suppliers are listed in the Owner's Supplier List for Construction Buyouts in Part 1 of this Appendix. Description and fabrication of Owner furnished items are as specified in the paragraphs herein.

### 2.2 INSTALLATION

- A. Owner's Preferred Flooring Contractor's (PFC) installation requirements are located in the individual Specifications Section and not in this Appendix A for the sake of consolidation for PFC.

### 2.3 PRODUCT MANUFACTURERS

- A. Owner's Suppliers will furnish products and equipment by one or more of the following manufacturers who are identified below for information only:
  1. ECORE Commercial Flooring, Lancaster, PA, (877) 258-0843.
  2. Regupol America, Lebanon, PA, (800) 537-8737.
  3. Mountville Mills.
  4. National Guard Products, Inc. (transitions).
  5. Hilti (fasteners only).
  6. Laminin (adhesive only).
  7. Mapei (adhesive only).
  8. Schonox (adhesive only).

### 2.4 RUBBER FLOORING AND ACCESSORIES

- A. Recycled Rubber Resilient Flooring: Non-laminated, single-ply, rolled recycled rubber and EPDM surface. 4' wide x 25' long roll; manufacturer's standard thickness. Treated with manufacturer's factory-applied water based protective sealer. Flooring shall be one of the following as furnished for project by the preselected supplier:
  1. RRF3:
    - a. ECOSurfaces EConights "Milky Way" (black field with gray chip) by Ecore Commercial.
    - b. Aktiv Series "Walmart #1706 Gray Fleck" by Regupol.
    - c. Genie Rubber Roll in Silver Grey by Mountville Mills.
- B. Transition Strip: 2"x3/8" extruded aluminum transition strip, beveled one edge at 21-degrees, predrilled for fasteners at not more than 12-inches on center:
  1. No. 8130 by National Guard Products, Inc.
  2. Fasteners: Hilti KWIK CON II+, 1/4" x 1-3/4" TFH (1/4" x 1-3/4" Torq Flathead).
- C. Accessories:
  1. Rubber Flooring Adhesive: Urethane, moisture cured, 0 VOC. One the following as selected by PFC and furnished for project by the preselected supplier:
    - a. [E-Grip III](#) One-Component Urethane Adhesive by ECORE.
    - b. [Schonox PU 900 2-Part Universal Adhesive](#) by Schonox.
    - c. [Ultrabond ECO 570 Urethane Rubber Flooring Adhesive](#) by Mapei.
    - d. 42-201 A+B Adhesive by Regupol.
    - e. Colossal 117-HMA by [Laminin Industries](#).
  2. Leveling and Patching Compounds: Trowelable, latex-modified, Portland cement based or blended hydraulic cement based formulation recommended by recycled rubber flooring manufacturer for applications indicated and furnished for project by the preselected supplier.

## 2.5 QUALITY ASSURANCE

- A. Regulatory Requirements for Resilient Flooring:
  - 1. Critical Radiant Flux: ASTM E 648. More than 0.45 Watts per square centimeter.
  - 2. Specific Optical Smoke Density: ASTM E 662. Less than 450.
- B. Environmental Requirements.
  - 1. Limit and control all noise, dust and moisture created by concrete surface preparation work to meet all local, state, and Federal ordinances, codes and laws.
  - 2. Limit and control damage from dust caused by slab surface preparation.
- C. Owner's Preferred Flooring Contractor: The Owner's Preferred Flooring Contractor (PFC) is a firm hired by and contracted by the Owner for the purpose of executing installation work within the scope of this section. Owner's PFC shall be one the following as determined by Owner:
  - 1. A&I Floor Covering: Contact Adam Difabrizio, (801) 509-9587 or Israel Kingston (801) 509-9588.
  - 2. Jones Tile: Contact Donna Ray, (573) 692-4033 or Clemet Jones (573) 836-0881.
  - 3. RMI: Contact D A Pope, (229) 424-8411, Guntra Harper (229) 468-9822, or Keisha Davis (229) 425-8842.
  - 4. Robinett: Contact Gayla Robinett, (918) 253-1425.

## 2.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products for receipt by Contractor on delivery date established by Contractor.
- B. Acceptance at Site: Contractor shall receive Owner furnished flooring and accessories in accordance with the requirements of Section 01600 and store flooring and accessories in accordance with the requirements of Section 09656.

## 2.7 REQUIREMENTS OF CONTRACTORS

- A. Preferred Flooring Contractor (PFC) shall be responsible for the following:
  - 1. Furnish installation materials and equipment.
  - 2. Compliance with safety and badging requirements of Contractor.
  - 3. Lead installer's attendance at morning communication meetings.
  - 4. Tracking of material usage and ensuring quantities on hand are sufficient for Work.
  - 5. Submission of Weekly Flooring Installation Report to Contractor and Owner's Construction Manager each Friday (as applicable for duration of work).
  - 6. Submission of any required Flooring Add-on Order forms. Contact Owner's Construction Manager for required forms.
    - a. Expedited freight charges incurred by add-on orders are the responsibility of the Preferred Flooring Contractor.
  - 7. Return to project Site 7-14 days prior to Grand Re-Opening for required corrections related to work specified herein.
- B. General Contractor shall be responsible for the following:
  - 1. Temporary electrical service for Preferred Flooring Contractor's equipment as described in Section 01500.
    - a. Contact the PFC for temporary electrical requirements of equipment prior to submission of Bid.
  - 2. Disposal of waste generated by flooring activities including, but not limited to, opened adhesive containers.
  - 3. Disconnection and reconnection electrical power to existing to remain equipment and fixtures, including registers, required to be moved for installation of flooring.
  - 4. Attendance at Pre-Possession meeting at site and time determined by Owner's Construction Manager to assist in determination of flooring installation and finishing schedule (Phasing Plan).
  - 5. Providing one container for storage of flooring and equipment for PFC's use. Storage container requirements are specified in Section 01500. Coordinate container provided for the work herein

- with containers to be provided for installation of resilient flooring materials specified in the scope of other Specifications Sections, if required.
6. Supervision of flooring scope of work, which includes, but is not limited to:
    - a. Flooring schedule Phasing Plan: Take lead role in developing the Phasing Plan with team (Owner's Construction Manager, Store Planning, and Preferred Flooring Contractor).
    - b. Ensuring Phasing Plan schedule is executed: Sequence of moves, daily flooring minimums, etc.
    - c. Ensuring conformance with the plans and specs.
  7. Identification of compromises in Owner's PFC's performance, if any, and communicating concerns to Owner's Construction Manager.
  8. Coordination of product delivery schedule with Owner's PFC.
  9. Submission of Flooring Return Request form to Supplier and ensuring receipt of required Return Authorization Documents.

## 2.8 PREPARATION BY OWNER'S PREFERRED FLOORING CONTRACTOR

- A. Prepare substrate for product installation according to ASTM F 710 and otherwise specified herein.
- B. Where scraping, sanding, or grinding of concrete surface is required to remove existing oil, grease, alkali salts, coatings, or compounds, and where sanding or grinding of concrete surface is required to remove irregularities, use proper dust control tools and methods to maintain dust emissions below the permissible level. Avoid organic solvents or liquid adhesive removers.
- C. Properly prepare expansion joints and fill contraction/construction joints with joint sealant or subfloor filler as specified in Section 09650. Do seal joints using polyurea.
- D. Verify that the concrete substrate surface is level. If necessary, use leveling compound as specified herein to achieve a substrate not exceeding the maximum allowable flatness deviation in accordance with ASTM F 710.
- E. Verify that the concrete substrate surface is smooth. Fill cracks, holes, and depressions with cementitious based underlayment, sanded smooth after curing, to achieve a level, flat, hard surface.
- F. Moisture Tests:
  1. Moisture Content and pH Tests:
    - a. Moisture content tests and pH tests will be conducted by Owner's Independent Concrete Consultant.
    - b. Moisture content in concrete substrate shall not exceed 5 pounds/1000 sq. ft./4 hours as measured by ASTM F 2170 RH meters.
    - c. Tests shall be taken in sufficient number and locations as required to obtain results representative of various areas to be covered by rubber flooring.
    - d. Tests shall be taken not more than 24 hours prior to application of flooring.
- G. Where sealers, curing compounds, and other previously applied substrate treatments are unknown, perform an adhesion test.
  1. Prepare and clean floor as specified in Preparation herein. Apply adhesive as specified herein and adhere sheet flooring patches. Verify proper adhesion of test area after 48 hours.
- H. Use a HEPA-rated filter vacuum to clean substrates to be covered by flooring immediately before installation. Do not dry sweep. After cleaning, examine substrates for moisture, alkaline salts, carbonation, and dust.
- I. Unroll rubber sheet flooring and allow it to relax and stabilize a minimum of 24 hours prior to installation. Flooring may be stored flat and stacked after unrolling in preparation for installation.
- J. Move flooring and installation materials into space where flooring will be installed or storage location with similar environmental conditions a minimum of 48 hours prior to installation.
  1. Do not install rubber sheet flooring until it is at the same temperature as the space where it is to be installed.

## 2.9 INSTALLATION BY OWNER'S PREFERRED FLOORING CONTRACTOR

APP A-47



- A. Install flooring after completion of final painting and other finishing work or furnish full protective covering of flooring.
- B. Comply with manufacturer's written installation instructions.
- C. Maintain room temperature during installation as near as possible to 65 degrees F for proper adhesive set.
- D. Lay out rubber sheet flooring pattern:
  - 1. Establish a uniform flooring sheet direction either parallel or across traffic flow in a pattern which minimizes the number of seams.
  - 2. Establish seams in inconspicuous and low-traffic areas, at least 6 inches away from parallel joints in floor substrates.
  - 3. Mark the floor substrate using chalk lines to show seams and overlaps.
- E. Dry-fit flooring sheets in place with overlapped 1/8-in. seams.
  - 1. Follow chalk-marked flooring pattern.
  - 2. Allow ends of rolls to run up the walls at least 2 inches.
  - 3. Scribe and cut flooring sheets to butt tightly to vertical surfaces, fixtures, and other adjoining work. Chalk-mark areas requiring cutting, including around openings or fixtures.
  - 4. Extend flooring into door reveals.
  - 5. Allow dry fit to sit for a minimum of 2 hours prior to applying adhesive.
- F. Before beginning adhesion, ensure that first seam is straight and aligned.
- G. Spread adhesive using a 1/16-in. square notched trowel.
- H. Place first flooring sheet and fold back half of the sheet adjacent to the wall onto itself exposing the floor substrate. Apply adhesive to the exposed floor substrate. Place first flooring sheet into the adhesive. The other half of the first sheet is to remain dry/without adhesive.
- I. Fold the dry half of the first flooring sheet back onto the adhered half. Fold the adjacent half of the second flooring sheet onto itself. This will result in an approximately 4 foot wide strip of exposed floor substrate.
- J. Apply adhesive to exposed floor substrate. Place the dry half of the first flooring sheet half onto the adhesive. Place folded back half of the second flooring sheet into the adhesive overlapping the first sheet by 1/8-in.
- K. Maintain first sheet in position and kick back the second sheet to create a tight seam.
- L. Continue flooring sheet installation across the space.
- M. Remove adhesive from flooring surfaces immediately during installation.
- N. Roll adhered flooring with a 75-100 lb articulated roller as follows:
  - 1. First roll the width of each sheet and then roll the length.
  - 2. Hand roll the seams and at corners and edges that cannot be accessed by large articulated roller.
  - 3. Temporarily hold seams in place with painter's tape. Do not use duct tape.
  - 4. Seams may be weighted during adhesive set time if necessary. Follow manufacturer's directions.

## 2.10 CLEANING BY OWNER'S PREFERRED FLOORING CONTRACTOR

- A. Clean flooring after foot traffic begins as follows:
  - 1. Broom clean or vacuum flooring thoroughly.
  - 2. Damp-mop flooring or clean with a soft pad on the auto scrubber (175 RPM or lower) to remove marks and soil.

- a. Where rubber flooring is to receive foot traffic entering from wet exterior weather conditions, frequently dry mop floor for 72 hours after installation.
3. Do not wet wash flooring for 72 hours after installation.

## 2.11 PROTECTION BY CONTRACTOR

- A. Contractor shall protect and maintain installed flooring as specified in Specifications Section 09656.

## SECTION 09680 – CARPET

### 2.1 SUPPLIER

- A. The scope of this Section is purchased through Owner's buyout program. Suppliers are listed in the Owner's Supplier List for Construction Buyouts in Part 1 of this Appendix.
- B. Description and fabrication of Owner furnished items are as specified in the paragraphs herein.

### 2.2 MANUFACTURERS

- A. Owner's Suppliers will furnish products and equipment by one or more of the following manufacturers who are identified below for information only:
  1. Interface, (800) 634-6032.
  2. J+J Flooring, a division of Engineered Floors, LLC, (800) 241-4586.
  3. Mannington Commercial, Calhoun, GA, (800) 241-2262.
  4. Mountville Mills, Inc, LaGrange, GA, (800) 241-5549.
  5. (Transition strips only) National Guard Products, Memphis, TN, (800) 647-7874.
  6. (Transition strips only) Ceramic Tool Company, Pewaukee, WI, (800) 236-5230.

### 2.3 PRODUCTS

- A. C-1: Cushion Back Carpet Tile:
  1. [Heartbeats Collection](#) by Interface. Tufted textured pattern loop, 100% recycled content nylon.
    - a. Tile Size: 50 cm x 50 cm. (19.69 in. square).
    - b. Pattern: Lighthearted.
    - c. Color: Illustrious.
    - d. Adhesive: XL Brands Pressure Sensitive Adhesive 2300.
  2. [Urban Avenue Collection](#) by J+J Flooring. 100% closed loop, 45% recycled content polyester felt cushion.
    - a. Tile Size: 24" x 24".
    - b. Color: Suburban 2836.
    - c. Adhesive: Kinetex Adhesive.
- B. Transition Strip: As furnished with carpet tile by carpet tile supplier.
  1. Pharmacy: Rubber transition strip (carpet to concrete).
  2. Pharmacy: Aluminum transition strip (carpet to tile).

## SECTION 09720 – DECORATIVE FAUX TILE WALL PANELS

### 2.1 SUPPLIER

- A. The scope of this Section is purchased through Owner's buyout program. Suppliers are listed in the Owner's Supplier List for Construction Buyouts in Part 1 of this Appendix.
- B. Description and fabrication of Owner furnished items are as specified in the paragraphs herein.

### 2.2 MANUFACTURERS

- A. Owner's Suppliers will furnish products and equipment by one or more of the following manufacturers who are identified below for information only.
  - 1. Composite Vinyl Faux Tile Panel: HangLock Panel Systems, LLC, Bridgeton, MO.
  - 2. FRP Faux Tile Panel: Marlite, Dover, OH.

### 2.3 DECORATIVE FAUX TILE WALL PANELS

- A. Description: Prefabricated wall panels with a tile-look embossment in 1/2 running bond pattern. Offset "hanging" tile on every other course to enable interlocking panel installation.
  - 1. FT1: White subway. Furnish one of the following products:
    - a. Composite Vinyl Faux Tile Panel: HangLock Brick 007 Series by HangLock Systems. Rigid vinyl and EPVC plastic bonded panels, 0.13 inch thick, brick dimensions approximately 3 in. x 6 in.
      - 1) Style and Color: Subway brick/tile pattern, frost white tile with black grout lines.
      - 2) Panel Size: 47 in x 45 in full brick panel; 47 in x 12 in straight corner panel.
    - b. FRP Faux Tile Panel: Symmetrix with SmartSeam Series SYM SS916-G63-R1 by Marlite. Fiber reinforced plastic coated panels, 0.09 inch thick, embossed, with physical characteristics as specified in Part 2 of Section 06610.
      - 1) Style and Color: Subway tile pattern, white tile with black score line.
      - 2) Panel Size: 4' x 4'.

### 2.4 ACCESSORIES

- A. Wall Adhesive: Titebond Advanced Polymer Panel Adhesive by Franklin International, as furnished with panels by Owner's pre-selected supplier.
- B. Trim:
  - 1. Bottom of Panel Trim and Top Cap: ¼ in. x ½ in. aluminum angle trim.
  - 2. Inside Corner Trim: Aluminum inside corner angle; 45, 90, and 135 degree angles as shown on Drawings.
  - 3. Standard Outside Corner Trim: Standard aluminum outside corner angle.
  - 4. High Impact Outside Corner Trim: High impact aluminum outside corner angle if shown on Drawings.
- C. Sealant: Manufacturer's Silicone Construction Sealant: Color match and manufacturer as determined by Owner.

## SECTION 10160 - METAL TOILET COMPARTMENTS

### 2.1 SUPPLIER

- A. The scope of this Section is purchased through Owner's buyout program. Suppliers are listed in the Owner's Supplier List for Construction Buyouts in Part 1 of this Appendix.
- B. Description and fabrication of Owner furnished items are as specified in the paragraphs herein.

### 2.2 MANUFACTURERS

- A. Owner's Suppliers will furnish products and equipment by one or more of the following manufacturers who are identified below for information only.
  - 1. [Flush Metal Partitions](#), (631) 768-8301.
  - 2. [Global Partitions](#), (an ASI Company), (706) 827-2700.
  - 3. [General Partitions](#), (814) 833-1154.
  - 4. [Hadrian Solutions, ULC](#), (440) 942-9118.
- B. Owner's Supplier will furnish products by the manufacturers listed herein with no substitutions.

### 2.3 DESCRIPTION

- A. Stainless Steel Partitions (Pedestal Floor Mount): Furnish systems with manufacturer's enhanced privacy options and other components as follows:
  - 1. Panels and Doors: Two-piece interlocking panel unit with corners brazed and finished smooth. Panel face minimum 22 gauge stainless steel 304, composite construction of insulated honeycomb core adhered to inner surfaces with moisture resistant adhesive, minimum 1-inch thick. Limited exposed fasteners on outside of partitions.
    - a. Panel and Door Mounting Distance from Floor: 6-inches above finished floor for standard stalls; 9-inches above finished floor as required for ADA stalls.
    - b. Panel and Door Height: 72-inch for 6-inch pedestal stalls; 69-inch for 9-inch pedestal stalls.
    - c. Pilaster Height: 76-inch to maintain minimum 82-inch from finished floor to top of headrail.
    - d. For ADA and ambulatory stalls, furnish solid wood backing for grab bar installation as required.
  - 2. Floor Mount Pedestal Support: Adjustable, cast stainless steel.
  - 3. Headrail: Satin Extruded clear anodized type 6463T5 aluminum channel; anti-grip design.
  - 4. Wall and Side Panel Mounting Brackets: 71inch, 18 gauge stainless steel #4 finish. Full length continuous (71-inch) stainless steel "U" brackets at connections from panels to walls.
  - 5. No-Sight Privacy Strips: Satin Aluminum to match head rail and stainless steel.
  - 6. Finish: Textured "diamond" pattern similar to Rigidized 5WL.
- B. Hardware:
  - 1. Hinge: Cast stainless steel, wrap-around and through-bolted.
  - 2. Occupancy Indicator Slide Latch: Tamper resistant full cast metal surface mounted slide latch, thru-bolted. Wrap around type, through bolted strike keeper. Must allow lift of door for emergency access.
    - a. Owner's Supplier will furnish approved latch with partition package.
  - 3. Coat Hook and Wall Bumper: Cast stainless steel with rubber bumper.
  - 4. Pull Handle: Cast stainless steel, through-bolted to door. 2 each in accordance with the requirements of ADA.
- C. Urinal Screens: Wall hung type, 24 inches by 48 inches to match toilet compartments.
- D. Screws/Fasteners: Tamper proof, stainless steel, 6-lobe/pin sex bolts and screws per manufacturer's installation instruction.

## SECTION 10260 - WALL AND CORNER GUARDS

### 2.4 SUPPLIERS

- A. The scope of this Section is purchased through Owner's buyout program. Suppliers are listed in the Owner's Supplier List for Construction Buyouts in Part 1 of this Appendix. Owner's Supplier will supply:
  - 1. Rubber Tire Stops.
  - 2. High Impact EDPM Corner Guards.
  - 3. High Impact Stainless Steel Gondola Corner Guards.
  - 4. Stainless Steel Corner Guards.
  - 5. Pharmacy Plastic Wall Radius End Guard.
  - 6. Floor Mount Diamond Plate Protection Rail System for Refrigerated Cases.
- B. Description and fabrication of Owner furnished items are as specified in the paragraphs herein.

### 2.5 RUBBER TIRE STOPS

- A. Recycled Rubber Tire Stop: Injection molded composite recycled rubber.
  - 1. Model: [Engineered Traffic Curb \(ETC\)](#) by Rubberform Recycled Products, LLC.
  - 2. Curb Section Size: 6-inches wide x 6-inches high x 36-inches long.
  - 3. Fastening: Lag bolted, three mounting holes per curb section.
  - 4. Color: Black.

### 2.6 HIGH IMPACT CORNER GUARDS

- A. Heavy Duty EPDM Corner Guard (typically at Cart Storage overhead door).
  - 1. Model: JOS-CRNR-090 by InPro.
  - 2. Size: 3 1/2" x 3 1/2" x 39".

## 2.7 PLASTIC WALL GUARDS

- A. Pharmacy Plastic Radius End Wall Guard: Vinyl bumper cover on continuous aluminum retainer, 1 5/8-inch deep x 8-feet long.
  - 1. Venus One Piece Partition End Guard CG-2130 by American Floor.
    - a. Color: Pearl Gray 289.

## 2.8 FLOOR MOUNT DIAMOND PLATE PROTECTION RAIL SYSTEM FOR REFRIGERATED CASES

- A. Diamond Plate Rail Assembly and installation accessories as required by the project will be furnished in assemblies by CSF or McCue.

## SECTION 10736 - METAL CANOPY

### 2.1 SUPPLIERS

- A. The scope of this Section is purchased through Owner's buyout program. Suppliers are listed in the Owner's Supplier List for Construction Buyouts in Part 1 of this Appendix.
- B. Description and fabrication of Owner furnished items are as specified in the paragraphs herein.

### 2.2 CANOPY PERFORMANCE REQUIREMENTS

- A. Structural Performance: Design canopies to withstand dead loads, live loads, snow loads, seismic loads and other loads as indicated on the Structural Drawings, without permanent deformation of components, or permanent damage to fasteners and anchors.

### 2.3 QUALITY ASSURANCE

- A. Installer Qualifications: Furnish installation by Contractors certified by the canopy system manufacturer.

### 2.4 ENGINEERED STEEL CANOPY SYSTEM

- A. Description:
  - 1. Pre-fabricated, field assembled steel canopy with steel deck, framing, drainage system, fascia, lighting, and accessories.
- B. Basic Components:
  - 1. Framing: Wide flange beams and tubular steel columns, bracing and miscellaneous framing members.
  - 2. Deck: Minimum 20 gage, Galvalume-coated, embossed, prefinished steel.
  - 3. Gutter: 0.032 aluminum prefinished internal gutter system.
  - 4. Drainage System: PVC leaders and internal downspouts, with prefinished metal covers to match decking for exposed leaders.
  - 5. Aluminum Composite Fascia Panels: ASTM E 331, 3 mm aluminum composite material.
    - a. No exposed fasteners allowed on exterior face.
    - b. 24 gauge fascia bracing and 18 gauge structural hat. Steel angle bracing not allowed.
    - c. Fascia system shall be protected throughout fabrication, transportation and installation with factory applied, strippable film.
  - 6. Lighting: Light fixtures furnished by Owner's canopy system supplier and installed by Contractor, including conduit, wiring, and final connections.
  - 7. Fasteners: Type required for materials being connected, with corrosion resistant finish. Furnish fasteners with neoprene or EPDM washers where required for weatherproofing.

8. Sealant: Type recommended by canopy manufacturer.
  9. Prefabricated canopy system components by canopy manufacturer shall include the complete canopy system exclusive of foundations and electrical conduit and wiring.
- C. Metal Canopy Finishes:
1. Structural Components and Downspouts: Prime coated for field finish application by General Contractor to match color shown on Drawings.
  2. Deck Panels and Gutters: Prefinished white.
  3. Metal Fascia Panels: Prefinished to match color shown on Drawings, gloss level 70 percent.

## SECTION 10810 - TOILET ACCESSORIES

### 2.1 SUPPLIERS

- A. The scope of this Section is purchased through Owner's buyout program. Suppliers are listed in the Owner's Supplier List for Construction Buyouts in Part 1 of this Appendix.
- B. Description and fabrication of Owner furnished buyout items are as specified in the paragraphs herein.
- C. Owner will furnish the items in this paragraph as fixture items and not buy-out items, supplier and model to be determined by Owner:
1. Soap dispensers.
  2. Surface mounted paper towel dispensers for non-customer restrooms (TLE and Pharmacy).MANUFACTURERS
- A. Owner's Suppliers will furnish products and equipment by one or more of the following manufacturers who are identified below for information only.
1. American Specialties Co., Inc. (ASI), Yonkers, NY, (914) 476-9000.
  2. Bemis Manufacturing Co, Sheboygan Falls, WI, (920) 467-4621 (Fuel only).
  3. Bobrick Washroom Equipment, Inc., North Hollywood, CA, (818) 982-9600.
  4. Bradley Corporation, Menomonee, WI, (800) 272-3539.
  5. Brady Worldwide, Inc., Milwaukee, WI, (888) 272-3946 or (888) 250-3082 (toilet signage).
  6. Dyson Inc. Chicago, IL.
  7. Excel Dryer Corporation, East Longmeadow, MA, (800) 255-9235.
  8. Foundations (Brocar), Inc., Medina, OH, (330) 722-5033.
  9. [Ginger](#), Santa Ana, CA, (949) 417-5207 (coat hook).
  10. Henkel Corporation, Rocky Hill, CT, (800) 624-7767 (thread lock compound).
  11. Mainline Collection (Fuel only).
  12. Meek Mirrors, Fort Smith, AR, (800) 643-2533.
  13. Saniflow Corp., Miami, FL.
  14. WingIts Innovations, LLC, Bradley Beach, NJ, (877) 894-6448 (grab bar wall fastener).
- B. Supplier will furnish products by the manufacturers listed herein with no substitutions.

### 2.3 FABRICATION OF ACCESSORIES - GENERAL

- A. Stainless Steel: AISI Type 302/304.
- B. Adhesive: Epoxy type contact cement.
- C. Finish: Stainless Steel: No. 4 satin finish or manufacturer's equivalent, unless specified otherwise.
- D. Furnish all welded construction, with smooth grinded joints.
- E. Form exposed surfaces from one sheet of stock with seamless corners, free of joints and exposed fasteners. Form surfaces flat without distortion. Maintain flat surfaces without scratches or dents.

- F. Furnish steel anchor plates and anchor components for installation on building finishes. Hot-dip galvanize ferrous metal anchors and fastening devices.
- G. Back-paint components where contact is made with building finishes to prevent electrolysis.
- H. Shop-assemble components and package complete with anchors and fittings.

#### 2.4 SCHEDULE OF ACCESSORIES

- A. Sanitary Napkin Disposal: Surface mount, removable 1.5 gall capacity locked waste cabinet.
  - 1. Fabrication: Waste receptacle, door, and cabinet 22 gauge type 304 stainless steel. Welded construction with no exposed fastening devices or exposed welded seams on cabinet.
  - 2. Overall Dimensions: Approx 15-in H x 11-in W x 4-in D. Verify height, width, and depth as specified by manufacturer of selected product.
  - 3. Push Door: Attached by concealed multi-staked piano hinges at top. Affixed with the international waste symbol.
  - 4. Finish: As specified herein under Fabrication.
  - 5. Furnish one of the following or an equivalent product by another manufacturer listed herein:
    - a. Model No. ASI 0473-1A by ASI.
    - b. Model No. 4722-15 by Bradley.
    - c. Model B-254 by Bobrick.
  
- B. Toilet Paper Dispensers: Surface mounted; twin jumbo roll capacity sliding access panel locked cabinet with refill indicator viewing slot.
  - 1. Fabrication: Door, mounting plate, and cabinet 22 gauge type 304 stainless steel. Welded construction with no exposed fastening devices or exposed welded seams. High impact ABS dispensing mechanism.
  - 2. Overall Dimensions: Approx 20-1/2 in W x 11-3/16 in H x 5 in deep. Verify height, width, and depth as specified by manufacturer of selected product.
  - 3. Finish: As specified herein under Fabrication.
  - 4. Furnish one of the following or an equivalent product by another manufacturer listed herein:
    - a. Model No. 0039 by American Specialties.
    - b. Model No. 5425-0000, by Bradley Corporation.
    - c. Model B-2892 ClassicSeries by Bobrick.
  
- A. Paper Towel Dispensers, Surface Mounted (Customer Restrooms): Compact arched-contour profile, lockable towel cabinet, center pull dispenser. Dispenser cabinet, door, and frame 22 gauge minimum, type 304 stainless steel.
  - 1. Furnish Model MET-PTD-0708200-REV-A, by Metzfab Industries. (Custom as supplied by Owner's Supplier).
  
- B. Toilet Seat Cover Dispensers: Surface mounted (one per each water closet), 22 gage type 304 stainless steel, satin finish.
  - 1. Model No. 0477SM by American Specialties.
  - 2. Model No. B221 by Bobrick.
  - 3. Model No. 5831 by Bradley.
  
- C. Electric Hand Dryers:
  - 1. Public Toilets: Brushed stainless steel, recessed, warm-air automatic (no-touch) model, infrared activated.
    - a. Characteristics: 110V, 1240W, 20,000 rpm motor, vandal resistant heating element, manually adjustable noise, speed, and heat control mechanism.
    - b. Furnish ADA-compliant recess kit.
    - c. Furnish the following or equivalent approved:
      - 1) Model: XL-SB XLerator Hand Dryer with Acorn EN2618-SS wall guard.
      - 2) Approved alternate assembly: Machflow M09ACS-UL by Saniflow with Acorn EN2618-SS wall guard and 3040-094-299 backplate.
  - 2. Non-Public Toilets: Stainless steel, surface mounted, warm-air automatic (no-touch) model.

- a. Characteristics: 110V, 1240W, 8,500 – 11,200 rpm, 43 – 57 CFM, adjustable speed motor.
  - b. Verify ADA compliant protrusion from wall.
  - c. Furnish one of the following or an equivalent product by another manufacturer listed herein:
    - 1) Model MO6ACS-UL Speedflow by Saniflow.
    - 2) Model 2902-287400 Aerix by Bradley.
- D. Diaper Changing Table: Stainless Steel Baby Changing Station.
- 1. Recessed Mounted.
    - a. Construction: Polyethylene body with 22 gauge brushed, Type 304 stainless steel exterior .
    - b. Rough Wall Opening: RWO requirements vary by manufacturer. Verify height, width, and depth as required by manufacturer of selected product
    - c. Furnish the following or an equivalent product by another manufacturer listed herein:
      - 1) Model 100-SSC-MCB by Foundations Worldwide, Inc.
      - 2) Model 9018 by ASI.
- E. Mirrors Above Lavatory (Restrooms): No. 1 quality 1/4 inch float glass electrolytically copper plated, tempered glass. Frameless, bevel edge; concealed theft resistant wall hanger, 18 x 36 inches unless otherwise shown.
- 1. Model No. M7110-1836 Beveled Edge Mirror by Meek.
- F. Standard Framed Mirrors (Fuel; Non-Public Restrooms in Store): No. 1 quality 1/4 inch float glass electrolytically copper plated, tempered glass. Mitered 22 gage satin finish stainless steel frame; concealed theft resistant wall hanger. Mirror size shall be 24 x 36 unless otherwise shown.
- 1. Model No.M2513, by Meek.
  - 2. Model No. 781-024362, by Bradley.
  - 3. If satin finished stainless steel is not available, furnish bright finished stainless steel by the same manufacturer as an approved alternate for non-public restrooms only.
- G. Dressing Mirrors (Women’s Restroom and Breakroom): No. 1 quality 1/4 inch float glass electrolytically copper plated, tempered glass. Mitered 22 gage stainless steel frame; concealed theft resistant wall hanger, 20 x 60 inches.
- 1. Model No. M2513 by Meek.
  - 2. If satin finished stainless steel is not available from specified manufacture, bright finished stainless steel by the same manufacturer may be substituted for non-public restrooms only.
- H. Lighted Mirrors: No. 1 quality ¼ inch float glass with polished edge, 18 inch x 36 inch, LED lighted on all sides. Concealed electrical access and theft resistant wall hanger.
- 1. Model No. ML-0500-S Halo Sidelit Mirror, by Meek.
  - 2. No substitutions allowed.
- I. Mirrors Above Lavatory (Restrooms): No. 1 quality 1/4 inch float glass electrolytically copper plated, tempered glass. Frameless, bevel edge; concealed theft resistant wall hanger, 18 x 36 inches unless otherwise shown.
- 1. Model No. M7110-1836 Beveled Edge Mirror by Meek.
- J. Coat Hook: Surface mounted, polished chrome, by Ginger.
- 1. Surface Double Hook: Model No 2810D.
- K. Grab Bars: 18 gage stainless steel; 1-1/4 inch diameter, (1-1/2 inch diameter where required by Local Code) textured grip surface; concealed mounting consisting of welded-on mounting flange with snap-on cover flange or escutcheon. Location, quantity, and length shall be as shown.
- 1. Model No. 3700 P, by American Specialties.
  - 2. Model No. B-5806.99, by Bobrick.
  - 3. Model No. 832-2, by Bradley.
  - 4. Model No. PB23XX Series by Mainline (1-1/2 inch diameter only).
- L. Grab Bar Hollow Wall Fasteners: GBW40 stainless steel commercial grab bar fasteners manufactured by WingIts Innovations, LLC.



- M. Cylinder-Style Waste Receptacle, Free Standing (Customer Restrooms): 30-gall capacity, extra-wide top opening, lift-off lid. Solid stainless steel construction with manufacturer's brushed stainless steel finish.
  - 1. Furnish Model CW1471 Bullet Open Can by Simplehuman.
- N. Waste Receptacle, Surface Mounted (Family Restroom)(Customer Restrooms): 16.5-gall capacity, front face curved-contour profile. 20 gauge type 304 stainless steel.
  - 1. Furnish Diplomat Series Model 3A15-11 with Vinyl Liner Part #P11-042 by Bradley.

## 2.5 SCHEDULE OF EQUIPMENT

- A. Restroom Door Foot Operated Opener: Commercial grade T6 aluminum, surface mount, including sexed center bolt and related fasteners as supplied by manufacturer. Silver finish. Owner's Supplier will furnish the following:
  - 1. [StepNPull](#) Hands-Free Foot Operated Door Opener, (417) 295-8001, [sales@stepmpull.com](mailto:sales@stepmpull.com) (HJC Item #1420113).
- B. Toilet Signage:
  - 1. Toilet wall and doors signs shall conform to California Code of Regulations Title 24 requirements. Furnish signs of size, configuration, and color as shown on the AHC Drawings. Signs shall be manufactured by a manufacturer regularly engaged in the production of equivalent signs.
  - 2. Signs shall be non-glare matte finish plastic injection molded plate with raised image relief area.

## SECTION 11136 – ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE)

### 2.1 SUPPLIERS

- A. The scope of this Section is purchased through Owner's buyout program. Suppliers are listed in the Owner's Supplier List for Construction Buyouts in Part 1 of this Appendix.
- B. Description and fabrication of Owner furnished items are as specified in the paragraphs herein.

### 2.2 ELECTRIC VEHICLE SUPPLY EQUIPMENT

- A. Manufacturer: ChargePoint, Inc., Campbell, CA. Contact Wes Bennion, [wes.bennion@chargepoint.com](mailto:wes.bennion@chargepoint.com); or Mike Casterline, [mike.casterline@chargepoint.com](mailto:mike.casterline@chargepoint.com).
  - 1. Level 2 (Overnight) Charger: Furnish ChargePoint Dual Port Pedestal Mount: Model CPF50-L18-PEDMNT-CMK8-Dual: 12kW L2 dual port with pedestal, 50A, Type 1, single phase with 18-ft cable and 8' cable management kit.
  - 2. Level 3 (DC Fast) Charger: Furnish ChargePoint Express 250 Station: Model CPE250C-625-CCS1-200A: 62.5kW DCFC, 2 power modules, one 14-ft CCS1 200A cable.
- B. System Activation: Owner's Electric Vehicle Supply Equipment management account shall be automatically established by Contractor's activation as described in Specifications Section 11136.
- C. Substitutions: Not permitted.

## SECTION 11141 – OIL AND FILTER WASTE CONTAINMENT DEVICES

### 2.1 SUPPLIERS

- A. The scope of this Section is purchased through Owner's buyout program. Suppliers are listed in the Owner's Supplier List for Construction Buyouts in Part 1 of this Appendix.
- B. Description of Owner furnished buyout items are as indicated on the Automotive Equipment Schedule on the Drawings, for installation by Contractor-hired certified installer (CI).

### 2.2 EQUIPMENT

- A. For Owner furnished DIY tank and Oil Filter Bin, contact the Senior Manager of Walmart Environmental Health and Safety Compliance, (479) 204-2501 or (479) 204-2108.

**SECTION 11400 - FOOD SERVICE EQUIPMENT (OWNER FURNISHED; INSTALLATION AS INDICATED ON SCHEDULE)**

**2.1 SUPPLIERS**

- A. The scope of this Section is purchased through Owner's buyout program. Suppliers are listed in the Owner's Supplier List for Construction Buyouts in Part 1 of this Appendix.
- B. Models and/or description of Owner furnished items are as scheduled in the Food Service Equipment Schedule on the Drawings.

**2.2 ADMINISTRATIVE REQUIREMENTS**

- A. Coordinate with Contractor so that equipment necessary for unloading (provided by Contractor) is available to unload equipment from truck and place into position.

**2.3 PREPARATION BY OWNER'S SUPPLIER/INSTALLER**

- A. Coordinate installation of food service equipment among related trades, vendors and installers.
- B. Verify that mechanical, plumbing, and electrical rough-ins have been properly located.
- C. Obtain necessary drawings, manufacturer's product data, and other data to provide a complete and proper installation.
- D. Check field dimensions prior to installing equipment. Verify necessary clearances and means of access from equipment storage to final position.

**2.4 INSTALLATION BY OWNER'S SUPPLIER/INSTALLER**

- A. Owner's Food Service Equipment Supplier will furnish food service equipment for installation by either Owner or the Contractor as indicated in Equipment Schedule on Drawings.
- B. Uncrate and set equipment in place plumb, level, and properly secured.
- C. Equipment installation shall be by Owner or Contractor as scheduled on Drawings. Installation shall be in accordance with manufacturer's requirements and installation instructions, unless otherwise indicated on Drawings.
- D. Final Connections: Contractor shall perform final mechanical, plumbing, and electrical connections for Owner installed equipment and Contractor installed equipment as required and recommended by manufacturer.

**2.5 CLEANING**

- A. Remove tape, wrapping, packing and such items used to facilitate shipping and handling from equipment.
- B. Clean equipment as specifically recommended by equipment manufacturer.

**2.6 OWNER TESTING AND INSPECTION (T&I)**

- A. Owner T&I shall be performed by the Owner's Food Service Equipment Supplier or Owner Furnished Equipment Manufacturer's Representative.
- B. Perform operational tests of equipment through full operational cycle and operate for a sufficient time to verify that equipment is operating within manufacturer's specifications.

- C. Operational tests shall be completed no later than one week after completion of equipment installation.
- D. Furnish adjustments or changes as required from operation test results.

**SECTION 13030 – PHARMACY MODULAR BUILDING COMPONENTS**

**2.1 SUPPLIERS**

- A. The scope of this Section is purchased through Owner’s buyout program. Suppliers are listed in the Owner’s Supplier List for Construction Buyouts in Part 1 of this Appendix.
- B. Description and fabrication of Owner furnished buyout items are as specified in the paragraphs herein.

**2.2 OTHER OWNER FURNISHED PRODUCTS**

- A. Owner equipment and services outside the scope of Owner’s Modular constructed packages but required to complete the Modular project are by Owner’s separate contract and Scheduled as “by Others” in the Responsibility Schedule herein.
- B. Privacy walls (including glazing), millwork/casework, and millwork assemblies for Modular Pharmacy are specified in Section 06400 within this Appendix A.

**2.3 SCHEDULING**

- A. Contractor shall contact specified Supplier/Installer for coordination and delivery of modular construction components and equipment.

**2.4 MODULAR PHARMACY SYSTEMS AND RESPONSIBILITY**

- A. Materials and equipment are furnished by Owner for installation by Owner or Contractor as scheduled below and as shown on Drawings.
- B. Primary Modular Pharmacy:

Items Furnished by Owner’s Modular Supplier	Installed by:
<b>Floor Finishes</b>	
Carpet tile and accessories.	Contractor
Resilient flooring.	Contractor
<b>Modular Walls</b>	
Panels pre-wired with metal surfaces factory prefinished.	Contractor
Installation hardware and caulking.	Contractor
Wall base.	Contractor
Protective surfacing.	Contractor
Corner guards and wall trim.	Contractor
Electrical receptacles and wiring to junction boxes above ceiling	Contractor
<b>Doors and Hardware</b>	
Hollow metal door frames preinstalled in modular wall panels.	Contractor
Hollow metal doors and hardware.	Contractor
Glazing preinstalled in doors.	Contractor
Coiling counter shutters (small shutters)	Contractor

Overhead rolling closure (large shutters)	Owner's Separate Contractor
<b>Ceilings</b>	
Modular ceiling panels with metal surfaces factory prefinished. Installation hardware and caulking.	Contractor
Acoustical ceiling grid and panels.	Contractor
Fire protection devices (whip and sprinkler head)	Contractor
HVAC: Supply diffuser and return grille preinstalled in ceiling panel.	Final connections by Contractor.
Light fixtures: Fixtures factory preinstalled in modular ceiling panels. Additional or emergency backup fixtures required by AHJ.	Owner's Mod Supplier Contractor
<b>Miscellaneous Equipment</b>	
Equipment arm in Health Services	Contractor
Equipment tree	Contractor
<b>Owner Items Furnished by Others</b>	<b>Installed by:</b>
Pill bays and fill pods	Contractor
Wall standards	Contractor
Refrigerators	Contractor
Computer brackets	Contractor
Cash drawers	Contractor
Health Services room chairs	Contractor
Signage	Owner's Separate Contractor
Alarm devices	Owner's Separate Contractor
Digital display	Contractor to install bracket only.
Checkout registers, computer systems and accessories	Owner's Separate Contractor
Sensormatic security devices	Owner's Separate Contractor

## SECTION 13300 - VERTICAL BARRIER NET SYSTEM

### 2.1 SUPPLIER

- A. The scope of this Section is purchased through Owner's buyout program. Suppliers are listed in the Owner's Supplier List for Construction Buyouts in Part 1 of this Appendix.
- B. Description, fabrication, and performance of Owner furnished items are as specified in the paragraphs herein.

### 2.2 MANUFACTURERS

- A. Owner's Suppliers will furnish products and equipment by one or more of the following manufacturers who are identified below for information only.
  1. InCord, Colchester, CT.
  2. Pucuda Leading Edge, Deep River, CT.

### 2.3 DESCRIPTION

- A. The system shall be designed to create a perimeter band of nets along the outer elevated surfaces of cooler/freezer boxes, with access locations for entry and exit from top of boxes.
- B. System shall not deflect below 39" above cooler/freezer top under maximum load conditions.
- C. System shall comply with requirements of OSHA 1910.23 and 1926.502.
- D. Basic Components: Manufactured mesh of high tenacity square mesh rope construction complete with supporting hardware.
- E. Mesh:
  - 1. Style - Knotless netting.
  - 2. Mesh Cord Diameter: 3/32 inch minimum.
  - 3. Mesh Size: Maximum 2 inch square opening measured between mesh joints, minimum 70% overall open area.
  - 4. Color: Black.
  - 5. Fire Retardancy.
    - a. NFPA 701.
    - b. ASTM E 84.
  - 6. Live Load Capacity: 250 lbs. minimum.
  - 7. Border: Three inch folded web border long edge top and bottom with grommets, 1/2" OD, at 24" o.c. in bottom edge.
  - 8. Height: Five ft. vertical height.
- F. Supporting Hardware:
  - 1. 3/8" Eyebolts: 220 lb safe working load. Size and spacing as indicated on the Drawings.
  - 2. Unistrut: P1001 or equivalent.
  - 3. Unistrut Angle Fitting: P1068 or equivalent.
  - 4. Wood Screws and Washers: Size and spacing as indicated on the Drawings.
  - 5. Sleeve Anchors: Size and spacing as indicated on the Drawings.
  - 6. Rod Couplings: Size and spacing as indicated on the Drawings
  - 7. Brackets: Steel or Stainless Steel Footman Loops, 400 lbs. minimum working load limit. Size and spacing as indicated on the Drawings.
  - 8. Lashing ties. Minimum loop tensile 250 lb. Color: Black.
- G. Web Straps: For attachment of net system to building structure, as indicated on the Drawings.
  - 1. Strap: One inch wide with integral metal mini cam buckle.
  - 2. Strap Color: Black.
  - 3. Working Load: Minimum of 400 lbs.
  - 4. Straps shall be unspliced.
- H. Wide Flange Beam Clamps: For attachment of net system to structural flange beams as shown and indicated on the Drawings.
  - 1. Description: Heavy duty steel jaw clamp with variable opening widths.
  - 2. Operation: Manually adjustable by rotating screw rod.
  - 3. Capacity: As determined for project requirements and furnished accordingly by Owner's Supplier.
  - 4. Finish: Manufacturer's standard powder coat.

## **SECTION 13810 – BUILDING AUTOMATION SYSTEM (BAS)**

### **2.1 SUPPLIERS**

- A. The scope of this Section is purchased through Owner's buyout program. Suppliers are listed in the Owner's Supplier List for Construction Buyouts in Part 1 of this Appendix.
- B. Description of Owner furnished items are as scheduled on Drawings.

- C. References in this section to Contractor shall mean the BAS Contractor.

## 2.2 WARRANTY

- A. Owner's BAS Supplier will furnish replacement parts for failures of Owner furnished equipment parts during installation period and for one year beyond store Grand Opening date. Owner will not pay additional cost associated with repair or replacement of materials and parts during the warranty period.

## 2.3 BUILDING AUTOMATION SYSTEM EQUIPMENT

- A. Building Automation and control system components shall be as indicated on Drawings.

## **SECTION 13900 - FIRE SUPPRESSION**

### 2.1 SUPPLIERS

- A. The scope of this Section is purchased through Owner's buyout program. Suppliers are listed in the Owner's Supplier List for Construction Buyouts in Part 1 of this Appendix.
- A. Description of Owner furnished items is as scheduled in the paragraphs below.
- B. Owner's Suppliers will furnish UL Listed (for Fire Protection) or FM Approved (for Fire Protection) materials complying with NFPA 13, unless noted otherwise in Contract Documents.

### 2.2 MANUFACTURERS

- A. Owner's Suppliers will furnish products and equipment by one or more of the following manufacturers who are identified below for information only.
  - a.
  - b. Sprinkler Heads (manufacturer and model as scheduled on Drawings): Owner's Suppliers will furnish sprinkler heads and escutcheons for installation by Contractor.

### 2.3 FIRE EXTINGUISHERS

- A. Furnish fire extinguishers and mounting hardware for installation by Contractor within the store.

## **SECTION 14580 – PNEUMATIC TUBE SYSTEM**

### 2.1 SUPPLIER/INSTALLER

- A. The scope of this Section is purchased through Owner's buyout program. Suppliers are listed in the Owner's Supplier List for Construction Buyouts in Part 1 of this Appendix.
- B. Description, fabrication, performance, and installation of Owner furnished items are as specified in the paragraphs herein.
- C. Substitutions: Not permitted.

### 2.2 SUBMITTALS

- A. Submit in accordance with Section 01330.
- B. High Wind Requirement: Submit to Contractor and Architect of Record documentation verifying system meets or exceeds wind requirement. Structural Engineer of Record shall review.
- C. Shop Drawings: Submit shop drawings to Contractor and Architect of Record:
  - 1. Submit within 30 days of contract award.

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2. Do not use reproductions of Contract Documents as shop drawings.
  3. Indicate profiles, layout, sizes, spacing, and locations of pneumatic tubes.
- D. Test and Inspection Reports: Submit to Contractor and Architect of Record reports of the following tests and inspections conducted at the site, as specified in Part 3 herein.
1. Visual examination.
  2. Transmission tests.
- E. Closeout Submittals: Verify Contractor has received the following for its Closeout requirements:
1. Manufacturer's descriptive literature.
  2. Operation and Maintenance Data: Include operating instructions, maintenance and repair data.
  3. Spare parts data.

### 2.3 SCHEDULING AND COORDINATION

- A. Contractor shall contact Supplier/Installer within 15 working days after award of Contract to coordinate installation work.

### 2.4 PHARMACY PNEUMATIC TUBE SYSTEM

- A. If project includes relocating pneumatic tube systems, do not reuse system tubes or components.
- B. One of the following pneumatic tube system models will be furnished and installed for the project by Owner's preselected Supplier:
1. Model 921 System Customer Unit with 10.4-in. CVM with Tilt Camera by ComCo Systems.
  2. Model HA-47 with Customer Video by Hamilton.
  3. Model QT-2010 "Open Chute" 4" x 7" remote pneumatic tube system by QTS.
- C. System Components:
1. Sub Station (Customer Units):
    - a. Audio: Two way.
    - b. Video: Color cameras, 10 inch minimum 12 inch minimum video monitor.
    - c. Privacy handsets on customer units.
    - d. Call button.
    - e. Vehicle sensor notification.
  2. Blower Pack Quantity:
    - a. For distances 300 feet or less: 3 blower packs.
    - b. For distances 300 feet to 600 feet: 4 blower packs.
    - c. For distances greater than 600 feet: Consult pneumatic tube system manufacturer.
  3. Associate Unit and Pharmacist Station:
    - a. Monitor Size: 7 inch minimum 12 inch minimum.
    - b. Audio / Video Components:
      - 1) Audio: Two way.
      - 2) Video: Color cameras.
      - 3) 3 consoles with video monitors and each with privacy handset, 1 console per lane, and 1 console at Pharmacist workstation.
  4. Transmission Tube: 4-in. x 7-in.
    - a. Zinc coated galvanized steel or ABS tubing, fittings, and bends.
    - b. Tube orientation as approved by tube manufacturer.
    - c. Sealant: Approved by system manufacturer.
  5. Vertical Risers.
  6. Ceiling Escutcheon Plate.
  7. 4" x 7" Carriers.
  8. Promo video and promo cards.
  9. A/V Hub (Computer).
  10. Control and communication cable required for complete installation.

- D. Power Requirements: Contractor shall provide electrical circuiting, conduit, boxes, and all appurtenances prior to Owner's installer beginning work.
  - 1. Location and termination of conduits and/or boxes are as required by system manufacturer and shown on the Electrical Drawings. Coordinate with Contractor for locations and final connections.

## 2.5 PHARMACY VEHICLE SENSOR AND ALERT SYSTEM

- A. Lane Sensor / Indicator for Vehicle Detection: One of the following sensor models will be furnished and installed for the project by Owner's preselected Supplier:
  - 1. Model AA 1547-IR Traffic Sensor by ComCo Systems.
  - 2. Model E10278-K33 by Hamilton.
  - 3. Model QTS-IT by QTS.
- B. Components:
  - 1. Manufacturer's standard electronic infrared sensor alert system with one sensor to detect vehicle motion in drive-through lanes. Motion sensor transmits interior audible notification signal (chime) incorporated within the Pneumatic Tube System audio/video components.

## 2.6 EXAMINATION

- A. Verify dimensions, tolerances, and method of installation of pneumatic tube system.
- B. Verify Contractor has completed preparations as necessary for installation of the system, including conduit for electrical, control wiring, audio/video cabling, and any other appurtenant and associated construction as shown or noted on Drawings.
- C. Verify routing requirements with Contractor prior to beginning installation.

## 2.7 INSTALLATION

- A. Install systems in accordance with system manufacturer's instructions and as indicated on Drawings.
- B. Install receivers where shown on Drawings. Do not deviate from location shown on Drawings without written approval from Owner's Pharmacy Operations.
  - 1. Installation by Owner's Installer in a location contrary to Drawings will result in correction and relocation of receivers by Owner's Installer at no additional expense to Owner or Contractor.
  - 2. Capture photographs of receiver installation and location and make photos available to Owner or Contractor upon request.
- C. If project includes system relocation, verify Contractor has removed existing pneumatic tube sections, provided a clear path for new location, and completed associated demolition as shown or noted on Drawings.
  - 1. Relocate existing under-counter AV hub to a wall below the ceiling near Associate Unit.

## 2.8 FIELD TESTING

- A. At completion of pneumatic tube system installation or relocation and in the presence of Contractor, verify proper operation by testing audio/video, wires, and cable to ensure equipment is in working order and properly assimilates with Pharmacy systems.

## **SECTION 15100 - BUILDING SERVICES PIPING AND EQUIPMENT**

### 2.1 SUPPLIERS

- A. The scope of this Section is purchased through Owner's buyout program. Suppliers are listed in the Owner's Supplier List for Construction Buyouts in Part 1 of this Appendix. Owner's Suppliers will supply the following:
  - 1. Water piping specialties.
  - 2. Drainage piping specialties.



- B. Description and fabrication of Owner furnished items is as scheduled in the paragraphs below.

## 2.2 PRODUCTS

### A. Water Piping Specialties:

- 1. Owner will furnish piping specialty products of manufacturers, types, and model numbers as indicated on the Plumbing Schedules on the Drawings, for installation by Contractor. Water piping specialties include such items as hose bibs, hydrants, valves, vacuum breakers, mixing valves, pressure reducing (regulating) valves, expansion tanks and accessories.

### B. Drainage Piping Specialties:

- 1. Piping specialties include products of manufacturers, types, and model numbers as indicated on the Plumbing Schedules on the Drawings. Drainage piping specialties shall include floor and roof drains, cleanouts, and accessories.

1.

## SECTION 15410 - PLUMBING FIXTURES

### 2.1 SUPPLIERS

- A. The scope of this Section is purchased through Owner's buyout program. Suppliers are listed in the Owner's Supplier List for Construction Buyouts in Part 1 of this Appendix.

- B. Description and fabrication of Owner furnished items is as scheduled in the paragraphs below.

### 2.2 MANUFACTURERS – PLUMBING FIXTURES

- A. Owner's Suppliers will furnish products and equipment by one or more of the following manufacturers who are identified below for information only.

- 1. Stop Valves:
  - a. Brass Craft Subsidiary; Masco Co.
  - b. Engineered Brass Company
  - c. McGuire Manufacturing Co., Inc.
  - d. Watts Brass and Tubular
  - e. Zurn Industries
- 2. P-traps, Strainers, Drains & Miscellaneous Fittings:
  - a. Brass Craft Subsidiary; Masco Co.
  - b. Dearborn Brass
  - c. Engineered Brass Company
  - d. McGuire Manufacturing Co., Inc.
  - e. Watts Brass and Tubular
  - f. Zurn Industries
- 3. Insulation Kits:
  - a. Brocar.
  - b. McGuire.
  - c. Plumberex.
  - d. Trap-Wrap.
  - e. Truebro, Inc.

- B. Fixture types and model numbers are as scheduled on the drawings.

- C. Owner's Pharmacy Water Filtration System Supplier: Fresh Water Systems. Contact: Rob Wadsworth, Pharmacy Operations Manager, (864) 284-1800, locations as shown on Drawings.

### 2.3 QUALITY ASSURANCE

- A. Regulatory Requirements:
  1. Products Requiring Electrical Connection: Listed and classified by Underwriter's Laboratories, Incorporated, and acceptable to the authority having jurisdiction as suitable for the purpose specified and indicated.
  2. Disabled Access: Conform to applicable local, State or Federal disabled access requirements for the operation of plumbing fixture.
  3. Lead-Free Compliance: Fixtures and fixture trim shall comply with the requirements of NSF 61 Annex G for lavatories, sinks and water coolers.

2.4 FIXTURE TRIM - DESCRIPTION

- A. Furnish each fixture complete with required trim.
- B. Exposed piping and trim shall be polished chrome-plated brass.
- C. Furnish each fixture with chrome-plated brass, quarter-turn angle stop valves.
- D. P-Traps and Sink Continuous Wastes: Polished chrome-plated, tubular brass, 17 gauge, with brass nuts on slip inlets, and of configurations indicated. P-traps shall have cleanout plugs.
- E. Escutcheons: Interior; Polished chrome-plated with set screw. Exterior; 304 stainless steel, wall flange.
- F. Stainless Steel (SS) Braided Water Supply: Flexible braided stainless steel outer sheathing with reinforced PVC inner tubing.
- G. Furnish flow-limiting device which limits flow to not more than 2.2 gpm for each sink except service and 3-compartment sinks. Furnish devices integral with fixture trim, wherever possible, and products of same manufacturer as fixture trim.
- H. Lavatory faucets for public use or within public restrooms shall be of the electronic self-closing type and shall have a maximum flow rate of 0.5 GPM in accordance with ASME/ANSI A112.18.1. Furnish devices integral with fixture trim, wherever possible, and products of same manufacturer as fixture trim.
- I. Flush Valves: Subject to compliance and compatible with plumbing fixtures as scheduled on the drawings. Furnish flush valves that do not exceed code requirements for maximum gallons per flush.
- J. Furnish trim as required to permit scheduled lavatory to be installed for handicap use.
- K. Furnish bolt caps with retainer clips on water closets.
- L. When specified on plans, general contractor to furnish faucets and sprayers for grocery hand sinks, three-compartment sinks, prep sinks and wash down stations. Contact the appropriate following manufacturer for parts numbers and local suppliers.
  1. Win-Holt, Louise Kennemer (Win-Holt), ikennemer@winholt.com, (800) 632-7222, ext. 1141.

**SECTION 15600 - REFRIGERATION SYSTEMS**

2.1 SUPPLIER

- A. The scope of this Section is purchased through Owner's buyout program. Suppliers are listed in the Owner's Supplier List for Construction Buyouts in Part 1 of this Appendix.
- B. Owner will furnish refrigeration equipment as scheduled and shown on Drawings for installation by Contractor which includes, but not limited to, the following:
  1. Condensers.
  2. Condensing Units.
  3. Evaporators.

4. Compressor Rack Systems.
5. Refrigerated cases.

- C. Owner will furnish and install refrigeration equipment as scheduled and shown on drawings which include but are not limited to, the following:
1. Walk-in Freezers and Coolers.]
- D. Description and fabrication of Owner furnished items is as scheduled in the paragraphs below.

## 2.2 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: Collect operation and maintenance manuals furnished by the case and rack OEMs and store them together at the refrigeration rack.
1. Product Data, including rated capacities of selected models, weights (shipping, installed, and operating), furnished specialties and accessories, and installation instructions.

## 2.3 WARRANTY

- A. Pursuant to the Construction Contract Between Walmart and Contractor, and with respect to work covered in this Section, the general construction one year warranty shall apply only to Contractor provided and installed equipment and materials and workmanship of Owner furnished, Contractor installed equipment.
- B. Owner's equipment manufacturer (OEM) will furnish replacement parts for failures of OEM parts during installation and one year general warranty period. Contractor shall obtain replacement parts from equipment manufacturer.

## 2.4 DELIVERY, STORAGE AND HANDLING

- A. Transport, handle, and store products in accordance with the requirements of Section 01600.
- B. Owner Furnished equipment which is damaged, defective or unsuitable for intended service shall be received by the Contractor and damage noted on the Bill of Lading and signed by the Contractor and Carrier agent. Immediately report Owner Furnished Equipment damage to Owner's Mechanical Construction Manager and include photos of damage and signed Bill of Lading.
- C. Contractor shall furnish a suitable means of securing and protecting all tools, materials, and equipment associated with refrigeration installation during construction period.
- D. Store refrigeration pipe and fittings in a clean and dry location. Receive fittings and store in closed containers or cartons, and store copper piping with rubber end plugs in place. Do not install copper tubing left uncapped for more than one day as refrigeration piping.
- E. Deliver brazing materials, flux, solvents, glues, sealants, insulation materials, lubricants, oils, and refrigerants required to complete refrigeration installation and store on job site in manufacturer's original packaging or crating with labeling intact and fully legible.
- F. Ship insulation materials and accessories such as adhesive and coatings to job site in marked, unopened containers as received from manufacturer. Store materials at job site in a proper manner, which does not damage, deface, or otherwise reduce their serviceability. Store highly flammable solvents, adhesives, and coatings in compliance with OSHA requirements. Store materials, which are susceptible to weather damage in a weatherproof environment and store materials with manufacturer's identification attached.
- G. SDSs for materials, compounds, and chemicals shall be maintained by the Contractor.

## 2.5 SEQUENCING, SCHEDULING, AND COORDINATION

- A. Sequence, schedule, and coordinate refrigeration installation and start-up activities with Owner's Mechanical Construction Manager to allow the overall project to be constructed in an orderly manner.

- B. Furnish personnel as necessary to match schedule needs.
- C. Send a representative to project meetings as required by the General Building Contractor.
- D. Purchase materials and arrange deliveries in a timely manner to avoid delay of the project. This may include taking early deliveries and off-site storage of items which might be in short supply.
- E. Furnish on-site storage container as required. Coordinate with General Building Contractor for location and availability of on-site storage space. Walk-in cooler and freezer boxes are not to be used for storage.
- F. Notify, coordinate, and correspond with legal authorities having jurisdiction for required inspections of the refrigeration system and piping during the installation process.
- G. Coordinate with Building Automation System Contractor for completion of check-out activities.
- H. Coordinate and confirm system start-up dates with Owner's Mechanical Construction Manager.
- I. Coordinate and confirm Functional Performance Testing dates with Refrigeration Engineer of Record.
- J. Coordinate with the General Contractor and other sub-contractors the placement of refrigeration, electrical, mechanical, plumbing, and fire sprinkler systems to fit in the available clear space.
- K. Start-Up of the refrigeration systems shall consist of the following:
  1. Inspect delivered equipment upon arrival for inconsistencies with refrigeration design documents and damage. Coordinate with refrigeration equipment supplier to correct deficiencies.
  2. Verify that systems have been properly installed and are ready for start-up prior to soft start date.
  3. Assure systems are operational prior to onsite visit by manufacturer representative. Charge systems in accordance with specifications and begin start-up process. Schedule start-up so that systems are operational before equipment manufacturer representative site visit for Commissioning phase. Document start-up completion on Handover Documents and submit to Owner's Mechanical Construction Manager by uploading documents to Owner's online construction management system within seven days after commissioning completion.
  4. System performance is reviewed by equipment manufacturer representative with assistance from the Contractor.
  5. Owner will not consider start-up complete until all Handover Documents are accepted complete by Owner's Mechanical Construction Manager.
  6. Supply technicians, tools, testing instruments, and materials necessary to adjust refrigeration equipment as directed by refrigeration equipment representative.

**SECTION 15700 - HEATING, VENTILATING, AND AIR CONDITIONING EQUIPMENT**

**2.1 SUPPLIERS**

- A. The scope of this Section is purchased through Owner's buyout program. Suppliers are listed in the Owner's Supplier List for Construction Buyouts in Part 1 of this Appendix.
- B. Owner's Suppliers will furnish the following heating, ventilating, and air conditioning equipment for installation by the Contractor:
  1. Roof top air conditioning units unless otherwise shown.
- C. Description and fabrication of Owner furnished items is as scheduled in the paragraphs below.

**2.2 QUALITY ASSURANCE**

- A. Certifications: Each item of equipment available with capacity ratings certified by AMCA and/or ARI, shall be furnished with capacity ratings so certified.

## 2.3 WARRANTY

- A. Owner furnished equipment shall be turned over to Owner in good working order. Prior to acceptance by Owner, equipment failures are under manufacturer's warranty. Notify equipment warranty contact specified herein for replacement or reimbursement information prior to beginning repairs. After acceptance by Owner, Contractor is not responsible for warranty repair.

## 2.4 SYSTEM START-UP

- A. Roof top air conditioning units (RTU) and air handling unit (AHU) commissioning shall be by the manufacturer factory trained personnel as specified in Specifications Section 15700.
  - 1. Initial Startup:
    - a. Remove shipping brackets and hardware
    - b. Verify OEM equipment protections are functioning
    - c. Verify motor/compressor rotation
    - d. Verify motor amperage
    - e. Verify gas pressure
  - 2. Final Startup:
    - f. Verify items from Initial Startup
    - g. Complete manufacturer's equipment startup procedure
    - h. Verify unit sequence of operation
- B. Start-up of other Owner and Contractor furnished HVAC equipment will be by the General Contractor as specified in Specifications Section 15700.

## 2.5 ROOF TOP AIR CONDITIONING UNITS

- A. Where required for roof top units, factory mount and wire smoke detectors in roof top unit unless noted otherwise on RTU schedule on Drawings.
  - 1. Manufacturer: Lennox, Inc.
  - 2.

## **SECTION 16100 - WIRING METHODS (OWNER FURNISHED ONLY AS NOTED BELOW, CONTRACTOR INSTALLED)**

- 2.1 Owner will furnish and install fire and security alarm system. Contractor shall provide rough-in as specified in Specifications Section 16100 and as indicated on drawings.

## **SECTION 16402 - LOW VOLTAGE SERVICE AND DISTRIBUTION**

### 2.1 SUPPLIERS

- A. The scope of this Section is purchased through Owner's buyout program. Suppliers are listed in the Owner's Supplier List for Construction Buyouts in Part 1 of this Appendix.
- B. Description and fabrication of Owner furnished items is as scheduled in the paragraphs below.
- C. Equipment shall bear name and trademark of manufacturer as listed above.

### 2.2 MANUFACTURERS

- 1.
- B. Owner's Suppliers will furnish products and equipment associated with the Interior Electrical Distribution system by one of the following manufacturers who are identified below for information only.
  - 1. Cutler Hammer/Eaton.
  - 2. GE/ABB.
  - 3. Siemens.

4. Square D.

2.3 PRODUCTS

- A. Owner's Suppliers will furnish the following electrical service and distribution equipment as shown on the drawings for installation by the Contractor:
1. Switchboards.
  2. Panelboards.
  3. LVDD (Intercom Disconnect).
  4. Contactors.
  5. Service Disconnect/Transfer Switch.
  6. Motor Starters.
  7. Fuses.

2.4 TRANSFORMER SUBMITTALS

- A. Owner's transformer Supplier will submit the following to Owner's Engineer of Record:
1. Product Data: Include rated nameplate data, capacities, weights, dimensions, minimum clearances, installed devices and features, technical certification sheets and performance for each type and size of transformer indicated.
  2. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
  3. Wiring Diagrams: Power, signal, and control wiring.
  4. Transformer ratings including:
    - a. kVA.
    - b. Primary and secondary voltage.
    - c. Taps.
    - d. Basic impulse level (BIL) for equipment over 600 volts.
    - e. Design impedance.
    - f. Insulation class and temperature rise.
    - g. Sound level.
    - h. Operation and Maintenance Data: For transformers to include in emergency, operation, and maintenance manuals.
- B. Transformers:
1. Transformers: general purpose, UL-listed/labeled. Comply with NEMA st-020 standards.
  2. Insulation class: for three phase transformers less than 15 KVA and all single phase – 185 degrees C, UL-component-recognized insulation system with a maximum of 115 degree C rise above a 40 degree C ambient temperature; for three phase transformers 15 KVA and larger - 220 degrees C, UL-component-recognized insulation system with a maximum of 150 degree C rise above a 40 degree C ambient temperature. UL-component-recognized insulation system replaces the UL1446 insulation rating system that used letters.
  3. Phases, voltages, and sizes: as indicated on the drawings.
  4. Sound level: not exceeding NEMA standards for the sizes indicated.
  5. Full-capacity primary taps: below 25 KVA –one 5 percent tap above and one 5 percent tap below; 25 KVA to 500 KVA - six 2.5 percent taps (2 above, 4 below); Above 500 KVA - four 2.5 percent (2 above, 2 below).
  6. Transformer core and coil assemblies: mounted on integral vibration-absorbing pads.
  7. Transformers 75 KVA and larger shall be floor mounted unless indicated otherwise. Transformers 45 KVA and smaller may be wall mounted where wall construction is suitable for the load. Floor mounted transformers shall be securely bolted to a 4 inch house keeping pad with vibration isolation pads. Wall mounted or suspended transformers shall have a means of isolating vibration from the support.
  8. Transformers up through 1000 KVA shall be mounted on elastomeric vibration isolation pads. Pad shall be constructed of neoprene, rubber, glass fiber, or a combination thereof. Pads shall be "ribbed" or "waffled" in texture. Pads shall be selected for smallest durometer (hardness),

- preferably less than 50. Deflection of pad shall be .25" static minimum. Stack pads until the desired deflection is achieved.
9. Make final conduit connections to transformers with flexible conduit, with at least 6 inches of slack in all directions.
  10. Transformer enclosures: fully enclosed (except for ventilation openings), NEMA 2, drip-proof, fabricated of heavy gauge sheet steel construction.
  11. Furnish Energy-efficient Transformers Complying with DOE 2016, when tested in accordance with DOE Test Method.
  12. K-rated transformers shall be furnished as indicated on the drawings and be listed for 115 degree C rise.

## **SECTION 16442 - BRANCH CIRCUIT, DISTRIBUTION PANELBOARDS, AND SWITCHBOARDS**

### **2.5 SUPPLIERS**

- A. The scope of this Section is purchased through Owner's buyout program. Suppliers are listed in the Owner's Supplier List for Construction Buyouts in Part 1 of this Appendix.
- B. Owner's Electrical Equipment Supplier will furnish electrical equipment as scheduled and shown on Drawings including but not limited to the following:
  1. Branch circuit and distribution panelboards.
  2. Non-service entrance switchboards.
- C. Description and fabrication of Owner furnished items is as scheduled in the paragraphs below.

### **2.6 MANUFACTURERS**

- A. Owner's Suppliers will furnish products and equipment by one or more of the following manufacturers who are identified below for information only.
  1. Eaton/Cutler Hammer.
  2. GE/ABB.
  3. Siemens.
  4. Square D.
- B. Owner furnished equipment will bear name and trademark of manufacturer as listed above.
- C. Substitutions not permitted.

### **2.7 SUBMITTALS**

- A. Owner's Supplier will submit the following to Owner's Engineer of Record:
  1. Product Data: For each type of panelboard or switchgear, switching and overcurrent protective device, instrumentation, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, weights, and finishes.
  2. Shop Drawings: For each switchgear and related equipment.
    - a. Include dimensioned plans, elevations, sections, and details, including required clearances, service space around equipment, and attachments to other work. Show tabulations of installed devices, equipment features, and ratings.
      - 1) Tabulate features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
    - b. Detail enclosure types and details.
    - c. Include outline and general arrangement drawing showing dimensions, shipping sections, and weights of each assembled section.
    - d. Detail bus configuration, current, and voltage ratings, including size and number of bus bars and current rating for each bus. Indicate mains and branches of phase, neutral, and ground buses.

- e. Detail short-circuit current rating of panelboard or switchgear assembly and overcurrent protective devices.
- f. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
- g. Include evidence of NRTL listing for series rating of installed devices.
- h. Include time-current coordination curves for each type and rating of overcurrent protective device included in panelboard or switchgear; include selectable ranges for each type of overcurrent protective device. Submit electronic files, in an SKM-compatible format.
- i. Include schematic and wiring diagrams for power, signal, and control wiring.

## 2.8 TENANT LIGHTING/APPLIANCE PANELBOARDS

- A. Panelboards: Install as scheduled on Drawings, including voltage, amperage, bus bracing, and interrupting ratings.
  - 1. Main lugs only (MLO), main circuit breaker (MCB), or main fusible switch (MFS) panelboard and branch devices as indicated on Schedule.
  - 2. Branch Circuit Protective Devices: Plug-on or bolted type thermal magnetic center-trip circuit breakers for alternating current, each with single-handle common trip. Tandem or half-sized circuit breakers or load center type construction not permitted. Circuit breaker Amp Interrupting Capacity (AIC) no less than values indicated on Drawings. Circuit breakers feeding emergency lights, night lights, time clock motors, etc. will be equipped with handle-locks where indicated on drawings, or required by NFPA 70.
  - 3. Cabinets: Zinc-coated sheet steel with knock-outs, listed and labeled by a Nationally Recognized Testing Laboratory. Trims and doors to have suitable primer coat and finish coat of manufacturer's standard color. Trims to be fitted with hinged doors having combined lock and latch. Locks will be keyed alike and furnished with two keys for each panelboard.
- B. Directory Holder: Contractor shall provide legible typewritten circuit directory properly identifying load(s) on each circuit mounted under clear plastic cover. Branch circuits shall be connected exactly as indicated on Panel Schedule.

## 2.9 BRANCH CIRCUIT AND DISTRIBUTION PANELBOARDS

- A. Panelboards for 240, 240/120 or 208Y/120 volt service shall be Square D, Type NQ or equivalent by manufacturers listed in this specification section.
- B. Panelboards for 480 or 480Y/277 volt service shall be Square D, Type NF or equivalent by manufacturers listed in this specification section.
- C. Unless noted otherwise, enclosures and trim fronts shall be NEMA Type 1 and shall be constructed in accordance with UL 50 requirements.
- D. Cabinets shall be constructed of one-piece code gauge galvanized steel with mounting studs, and shall have wiring gutters of ample size and knockouts for conduit connections as required.
- E. Interior trim shall be dead-front construction to shield user from energized parts.
- F. Trim front shall be painted gray enamel. Trim front with hinged door shall be one piece where applicable. Trim front with door shall have cylindrical tumbler type lock. All lock assemblies shall be keyed alike. Furnish two (2) keys for each lock.
- G. Panelboard shall be furnished with a clear plastic cover typewritten directory located on the inside of the door where applicable. Typewritten circuit directory shall properly identify load on each circuit mounted under clear plastic cover.
- H. Buses and Connections: Three phase, four wire unless otherwise indicated.
  - 1. Furnish phase bus arrangement A, B, C from left to right when viewed from the front of the panelboard.
  - 2. Phase and Neutral-Bus Material: Hard-drawn copper of 98 percent conductivity, silver-plated.



3. Load Terminals: Furnish load terminals for future circuit-breaker positions at full-ampere rating of circuit-breaker position.
  4. Neutral Buses: 100 percent of the ampacity of phase buses unless otherwise indicated, equipped with mechanical connectors for outgoing circuit neutral cables. Brace bus extensions for busway feeder neutral bus.
- I. Branch circuit breakers shall be molded case, thermal magnetic, quick-make, quick break type. Breakers shall be calibrated for operation in an ambient temperature of 40°C. Breakers shall be bolt on type of single unit construction. Two and three pole breakers, where called for, shall be single unit common trip. Tandem or half-size circuit breakers are not permitted.
  - J. Branch circuit breakers shall have the following minimum short circuit ratings: 10K AIC for 240V or 208V systems and 14K AIC for 480V systems. Reference Drawings for project specific AIC ratings which may exceed these minimum ratings.
  - K. Unless noted otherwise on the Drawings, all ground fault interrupting (GFI) branch circuit breakers shall incorporate overload, short circuit and UL Class A (5 milliamp sensitivity) for personnel protection. Ground fault circuit breakers with 30 milliamp sensitivity shall be used for equipment protection applications only.
  - L. Breakers serving heating/air conditioning/refrigeration equipment shall be UL Listed "HACR" Type.

## 2.10 NON-SERVICE ENTRANCE SWITCHBOARDS

- A. Obtain switchboards, overcurrent protective devices, components, and accessories from single source from single manufacturer.
- B. Switchboards shall be steel, NEMA 250, Type 1, by manufacturers listed in this specification section and comply with NEMA PB 2, NFPA 70, and UL 891.
- C. Nominal system voltage as indicated on plans.
- D. Switchboard shall be minimum 65K AIC fully rated. Reference Drawings for project specific AIC ratings which may exceed these minimum ratings.
- E. Switchboard shall be front connected and front accessible.
- F. Switchboard enclosure shall have factory-applied finish in manufacturer's standard gray finish over a rust-inhibiting primer on treated metal surface; undersurfaces treated with corrosion-resistant undercoating.
- G. Drawings indicate maximum dimensions for switchboards including clearances between switchboards and adjacent surfaces and other items. Comply with indicated maximum dimensions.
- H. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- I. Removable Compartment Covers: Secured by standard bolts, for access to rear interior of switchboard.
- J. Front panels shall be hinged for draw out circuit breakers and access to accessories. Front panels shall be standard screw removable for fixed circuit breakers and blank spaces.
- K. Buses and Connections: Three phase, four wire unless otherwise indicated.
  1. Furnish phase bus arrangement A, B, C from front to back, top to bottom, and left to right when viewed from the front of the switchboard.
  2. Phase and Neutral-Bus Material: Hard-drawn copper of 98 percent conductivity, silver-plated.
  3. Copper feeder circuit-breaker line connections.
  4. Load Terminals: Furnish load terminals for future circuit-breaker positions at full-ampere rating of circuit-breaker position.

5. Ground Bus: 1/4-by-2-inch- hard-drawn copper of 98 percent conductivity, equipped with mechanical connectors for feeder and branch-circuit ground conductors.
  6. Main-Phase Buses and Equipment-Ground Buses: Uniform capacity for entire length of switchboard's main and distribution sections.
  7. Neutral Buses: 100 percent of the ampacity of phase buses unless otherwise indicated, equipped with mechanical connectors for outgoing circuit neutral cables. Brace bus extensions for busway feeder neutral bus.
- L. Future Devices: Equip compartments with mounting brackets, supports, bus connections, and appurtenances at full rating of circuit-breaker compartment.
- M. Breakers shall be Molded-Case Circuit Breaker (MCCB) type and comply with UL 489, with interrupting capacity to meet available fault currents.
1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
  2. Adjustable Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.
  3. Electronic trip circuit breakers with rms sensing; field-replaceable rating plug or field-replicable electronic trip; and the following field-adjustable settings:
    - a. Instantaneous trip.
    - b. Long and short-time pickup levels.
    - c. Long and short-time adjustments.
    - d. Ground-fault pickup level, time delay, and  $I^2t$  response.
  4. Current-Limiting Circuit Breakers: Frame sizes 400 A and smaller; let-through ratings less than NEMA FU 1, RK-5.
  5. MCCB Features and Accessories:
    - a. Standard frame sizes, trip ratings, and number of poles.
    - b. Lugs: Mechanical style, suitable for number, size, trip ratings, and conductor material.
    - c. Ground-Fault Protection: Integrally mounted relay and trip unit with adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator.
  6. Breakers serving heating/air conditioning/refrigeration equipment shall be UL Listed "HACR" Type.
  7. Circuit breakers shall have a minimum 65K AIC short circuit rating. Reference Drawings for project specific AIC ratings which may exceed this minimum rating.

## **SECTION 16500 - LIGHTING**

### **2.1 SUPPLIERS**

- A. The scope of this Section is purchased through Owner's buyout program. Suppliers are listed in the Owner's Supplier List for Construction Buyouts in Part 1 of this Appendix.
- B. Description of Owner furnished items is as scheduled on Drawings.

### **2.2 PRODUCTS**

- A. Owner's Suppliers will furnish lighting fixtures and lamps as shown on the Lighting Fixture Schedule as indicated on Drawings, for installation by Contractor.

### **2.3 QUALITY ASSURANCE**

- A. Fixtures and their electrical components will bear the label of a nationally recognized testing laboratory.

### **2.4 MAINTENANCE AND REPLACEMENT DURING CONSTRUCTION**

- A. Owner Responsibility:

1. Provision for oversupply of three percent additional fluorescent lamps with initial lighting fixture shipment.
2. Evaluation of abnormally high failure percentage and replacement covered under warranty will be furnished by Owner's supplier on site.
3. Costs for replacement of parts damaged during shipment.

#### **SECTION 16525 - SITE LIGHTING**

##### **2.5 SITE LIGHTING LUMINAIRES**

- A. The scope of this Section is purchased through Owner's buyout program. Suppliers are listed in the Owner's Supplier List for Construction Buyouts in Part 1 of this Appendix.

##### **2.6 QUALITY ASSURANCE**

- A. Fixtures and their electrical components will bear a UL Label.

##### **2.7 OWNER RESPONSIBILITY**

- A. Costs for replacement for normal failure covered by warranty of any fixture, lamp, or ballast/driver prior to Grand Opening. Evaluation of abnormally high failure percentage and replacement covered under warranty will be furnished by vendor on site.
- B. Costs for replacement of parts damaged during shipment. Charges will be made to shipping carrier or responsible party.

#### **SECTION 16700 - COMMUNICATIONS (OWNER FURNISHED AND INSTALLED ONLY AS NOTED BELOW)**

##### **2.1 VOICE/DATA SYSTEM**

- A. Owner will furnish and install voice/data cable equipment.

## REFERENCES

- A. American Institute of Steel Construction (AISC):
1. AISC 303 - Code of Standard Practice for Steel Buildings and Bridges.
  2. AISC 360 - Structural Steel Buildings.
  3. Specification for the Design of Cold-Formed Steel Structural Members.
- B. American National Standards Institute (ANSI):
1. ANSI A 14.3 - Ladders, Fixed, Safety Requirements.
  2. ANSI A 108, A 118, A 136 - American National Standards for the Installation of Ceramic Tile (Includes ANSI A108.01, A108.02, A108.1A-C, 108.4 -.13, A118.1-.12, and ANSI A136.1)
  3. ANSI A 108.02 - Materials, Environmental, and Workmanship, General Requirements.
  4. ANSI A 108.5 - Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex Portland Cement Mortar.
  5. ANSI A117.1 - Guidelines For Accessible And Usable Buildings And Facilities.
  6. ANSI A 118.4 - Latex-Portland Cement Mortar.
  7. ANSI A 137.1 - Specifications for Ceramic Tile.
  8. ANSI A 156.2 - Bored and Preassembled Locks and Latches.
  9. ANSI A 156.6 - Architectural Door Trim.
  10. ANSI/BHMA A 156.9 - Cabinet Hardware.
  11. ANSI (BHMA) A156.10 - Power Operated Pedestrian Doors.
  12. ANSI/BHMA A 156.11 - Cabinet Locks.
  13. ANSI A 156.13 - Mortise Locks and Latches.
  14. ANSI A 156.15 - Release Devices - Closer Holder, Electromagnetic and Electromechanical.
  15. ANSI/BHMA A 156.18 - Materials & Finishes.
  16. ANSI A208.1 - Particleboard.
  17. ANSI A208.2 - Medium Density Fiberboard For Interior Use.
  18. ANSI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.
  19. ANSI A250.8 (Formerly SDI-100) - Recommended Specifications for Standard Steel Doors and Frames.
  20. ANSI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
  21. ANSI A250.11 (Formerly SDI-105) - Recommended Erection Instructions for Steel Frames.
  22. ANSI B16.3 - Malleable Iron Threaded Fittings.
  23. ANSI B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings.
  24. ANSI B16.22 - Wrought Copper & Copper Alloy Solder-Joint Pressure.
    - a. ANSI/ASME B1.20.1 - Pipe Threads, General Purpose (Inch).
  25. ANSI B93.4 - Hydraulic Line Welded Tubing.
  26. ANSI C 12.1 - Electric Meters Code for Electricity Metering.
    - a. ANSI/ASME B31.9 - Building Services Piping
  27. ANSI C 12.20 - Standard for Electricity Meter - 0.2 and 0.5 Accuracy Classes.
  28. ANSI Z97.1 - For Safety Glazing Materials Used In Buildings - Safety Performance Specifications and Methods Of Test.
  29. ANSI Z97.1 - Safety Glazing Material Used in Buildings.
  30. ANSI MH16.1 - Specifications for the Design, Testing and Utilization of Industrial Steel Storage Racks.
- C. ASTM International (ASTM):
1. ASTM A 36 - Carbon Structural Steel.
  2. ASTM A 47 - Ferritic Malleable Iron Castings.
  3. ASTM A 53 - Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
  4. ASTM A74 - Hub and Spigot Cast Iron Soil Pipe and Fittings.
  5. ASTM A 108 - Steel Bar, Carbon and Alloy, Cold-Finished.
  6. ASTM A 123 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
  7. ASTM A 153 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

8. ASTM A 234 - Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service.
9. ASTM A 240 - Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
10. ASTM A 249/A - Welded Austenitic Steel Boiler, Superheater, Heat-Exchanger, and Condenser Tubes.
11. ASTM A 269 - Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
12. ASTM A 307 - Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
13. ASTM A 325 - Structural Bolts, Heat Treated, 120/105 ksi Minimum Tensile Strength.
14. ASTM A 463 - Steel Sheet, Aluminum Coated by the Hot-Dip Process.
15. ASTM A 490 - Structural Bolts, Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength.
16. ASTM A 500 - Cold-formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
17. ASTM A 501 - Hot-Formed Welded and Seamless Carbon Steel Structural Tubing
18. ASTM A 536 - Ductile Iron Castings.
19. ASTM A 653 - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
20. ASTM A 666 - Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
21. ASTM A 591 - Steel Sheet, Electrolytic Zinc-Coated, for Light Coating Mass Applications.
22. ASTM A 792 - Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
23. ASTM A 795 - Black And Hot-Dipped Zinc-Coated (Galvanized) Welded And Seamless Steel Pipe For Fire Protection Use.
24. ASTM A861 - High-Silicon Iron Pipe and Fittings.
25. ASTM A 865 - Threaded Couplings, Steel, Black Or Zinc-Coated (Galvanized) Welded Or Seamless, For Use In Steel Pipe joints.
26. ASTM A888 - Hubless Cast Iron Soil Pipe and Fittings.
27. ASTM A 992 - Structural Steel Shapes.
28. ASTM A 1008 - Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, Baked Hardenable.
29. ASTM A 1011 - Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
30. ASTM B75 - Seamless Copper Tube.
31. ASTM B88 - Seamless Copper Water Tube.
32. ASTM B135 - Seamless Brass Tube.
33. ASTM B 221 - Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
34. ASTM B 280 - Seamless Copper Tube for Air Conditioning and Refrigeration Field Service.
35. ASTM B306 - Copper Drainage Tube (DWV).
36. ASTM B584 - Copper Alloy Sand Castings for General Applications.
37. ASTM B306 - Copper Drainage Tube (DWV).
38. ASTM B584 - Copper Alloy Sand Castings for General Applications.
39. ASTM B 221 - Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
40. ASTM B 813 - Liquid and Paste Fluxes for Soldering of Copper and Copper Alloy Tube.
41. ASTM C 553 - Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications
42. ASTM C564 - Rubber Gaskets for Cast Iron Soil Pipe and Fittings.
43. ASTM C 578 - Rigid, Cellular Polystyrene Thermal Insulation.
44. ASTM C 921 - Determining the Properties of Jacketing Materials for Thermal Insulation.
45. ASTM C 1107 - Packaged Dry, Hydraulic-Cement Grout (Nonsrink).
46. ASTM C 1048 - Heat-Treated Flat Glass - Kind HS, Kind FT Coated and Uncoated Glass.
47. ASTM C 1071 - Thermal and Acoustical Insulation (Mineral Fiber, Dust Lining Material.
48. ASTM C 1136 - Flexible, Low Permeance Vapor Retarders for Thermal Insulation
49. ASTM C1277 - Shielded Couplings Joining Hubless Cast Iron Soil Pipe and Fittings.
50. ASTM C1540 - Heavy Duty Shielded Couplings Joining Hubless Cast Iron Soil Pipe and Fittings.
51. ASTM C 1290 - Flexible Fibrous Glass Blanket Insulation Used to Externally Insulate HVAC Ducts
52. ASTM C 1710 - Installation of Flexible Closed Cell Preformed Insulation in Tube and Sheet Form.

53. ASTM D570 - Standard Test Method For Water Absorption Of Plastics
54. ASTM D648 - Standard Test Method For Deflection Temperature Of Plastics Under Flexural Load In The Edgewise Position
55. ASTM D695 - Standard Test Method For Compressive Properties Of Rigid Plastics
56. ASTM D732 - Standard Test Method For Shear Strength Of Plastics By Punch Tool
57. ASTM D 1187 - Asphalt-Base Emulsions for Use as Protective Coatings for Metal.
58. ASTM D 1785 - Poly vinyl Chloride (PVC) Plastic Pipe, Schedules 40, 80, and 120.
59. ASTM D2000 - Standard Classification System for Rubber Products in Automotive Applications.
60. ASTM D2240 - Standard Test Method For Rubber Property - Durometer Hardness
61. ASTM D 2466 - Polyvinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 40.
62. ASTM D2467- Polyvinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 80.
63. ASTM D 2564 - Solvent Cements for Polyvinyl Chloride (PVC) Plastic Pipe and Fittings.
64. ASTM D 2665 - Polyvinyl Chloride (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings.
65. ASTM D2609 - Plastic Insert Fittings for Polyethylene (PE) Plastic Pipe.
66. ASTM D 2855 - Making Solvent-Cemented Joints with Polyvinyl Chloride (PVC) Pipe and Fittings.
67. ASTM D3311 - Drain, Waste, and Vent (DWV) Plastic Fittings Patterns
68. ASTM D 4985 - Low Silicate Ethylene Glycol Base Engine Coolant for Heavy Duty Engines Requiring a Pre-Charge of Supplemental Coolant Additive (SCA).
69. ASTM D5420 - Standard Test Method for Impact Resistance of Flat, Rigid Plastic Specimen by Means of a Striker Impacted by a Falling Weight (Gardner Impact)
70. ASTM E 84 - Test Method for Surface Burning Characteristics of Building Materials.
71. ASTM E96 - Water Vapor Transmission Materials.
72. ASTM E 119 - Fire Tests Of Building Construction And Materials.
73. ASTM E152 - Methods of Fire Tests of Door Assemblies.
74. by the Hot-Dip Process.
75. ASTM E 330 - Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
76. ASTM E 648 - Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.
77. ASTM E 662 - Specific Optical Density of Smoke Generated by Solid Materials.
78. ASTM E 709 - Standard Guide for Magnetic Particle Testing
79. ASTM E 1886 - Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials.
80. ASTM E 1996 - Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes.
81. ASTM E 2129 - Standard Practice for Data Collection for Sustainability Assessment of Building Products.
82. ASTM F439 - Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80.
83. ASTM F441 - Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 And 80.
84. ASTM F493 - Solvent Cements for CPVC Pipe and Fittings.
85. ASTM F656 - Primers For Use in Solvents Cement Joints of Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings.
86. ASTM F 710 - Preparing Concrete Floors to Receive Resilient Flooring.
87. ASTM F876 - Crosslinked Polyethylene (PEX) Tubing.
88. ASTM F877 - Crosslinked Polyethylene (PEX) Plastic Hot and Cold Water Distribution Systems.
89. ASTM F 1066 - Vinyl Composition Floor Tile.
90. ASTM F 1700 - Solid Vinyl Floor Tile.
91. ASTM F1807 - Metal Insert Fittings Utilizing a Copper Crimp Ring for SDR9 Cross-linked Polyethylene (PEX) tubing.
92. ASTM F1861 - Resilient Wall Base
93. ASTM F 1869 - Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
94. ASTM F 2389 - Pressure-rated Polypropylene (PP) Piping Systems.
95. ASTM F1807 - Metal Insert Fittings Utilizing a Copper Crimp Ring for SDR9 Cross-linked Polyethylene (PEX) tubing.

96. ASTM F1960 - Cold Expansion Fittings with PEX Reinforcing Rings for Use with Cross-linked Polyethylene (PEX) Tubing.
  97. ASTM F2014 - Non-Reinforced Extruded Tee Connections for Piping Applications.
  98. ASTM F2023 - Standard Test Method for Evaluating the Oxidative Resistance of Plastic Piping to Hot Chlorinated Water.
  99. ASTM F2098 - Stainless Steel Clamps for Securing SDR9 Cross-linked Polyethylene (PEX) Tubing to Metal Insert Fittings.
  100. ASTM-F2389 - Pressure-rated Polypropylene (PP) Piping Systems.
- D. Air Movement and Control Association (AMCA):
1. AMCA 500-D - Laboratory Methods for Testing Dampers for Rating.
  2. AMCA 500-L - Laboratory Methods for Testing Louvers for Rating.
- E. Aluminum Association (AA):
1. Specifications for Aluminum Structures.
- F. American Association of Automatic Door Manufacturers (AAADM):
1. AAADM Inspector Certification Program.
- G. American Petroleum Institute (API):
1. API 1615 - Installation of Underground Petroleum Storage Systems.
- H. American Plywood Association (APA): APA - Grades & Specifications.
- I. American Society of Civil Engineers/Structural Engineering Institute (ASCE/SEI)
1. ASCE/SEI 7 - Minimum Design Loads for Buildings and Other Structures.
- J. American Society of Mechanical Engineers (ASME):
1. ASME A13.1 - Scheme for the Identification of Piping Systems.
  2. ASME B 1.1 - Unified Inch Screw Threads (UN and UNR Thread Form).
  3. ASME B 16.1 - Cast Iron Pipe Flanges And Flanged Fittings.
  4. ASME B 16.3 - Malleable Iron Threaded Fittings.
  5. ASME B 16.4 - Gray Iron Threaded Fittings.
  6. ASME B 16.5 - Pipe Flanges And Flanged Fittings NPS 1/2 Through NPS 24 Metric/Inch Standard.
  7. ASME B 16.9 - Factory-Made Wrought Butt Welding Fittings.
  8. ASME B 16.11 - Forged Fittings, Socket-Welding And Threaded.
  9. ASME B 31.5 - Refrigeration Piping Standard
  10. ASME /ANSI A112.18.1 - Plumbing Fixture Fittings.
- K. American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE):
1. ASHRAE Standard 90.1-Energy Standard for Buildings Except Low-Rise Residential Buildings.
  2. ANSI/ASHRAE Standard 15 - Safety Standard for Refrigeration Systems.
- L. Americans with Disabilities Act (ADA):
1. 28 CFR Part 36 - ADA Standards for Accessible Design.
- M. American Water Works Association (AWWA):
1. AWWA C104 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
  2. AWWA C115 - Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.
  3. AWWA C151 - Ductile-Iron Pipe, Centrifugally Cast.
  4. AWWA C651 - Disinfecting Water Mains.
- N. American Welding Society (AWS):
1. AWS D1.1 - Structural Welding Code.
  2. AWS D1.3 - Structural Welding Code - Sheet Steel.

- O. Architectural Woodwork Institute (AWI) / Architectural Woodwork Manufacturers Association of Canada (AWMAC) / Woodwork Institute (WI) - Joint Publication:
  - 1. AWI/AWMAC/WI - Architectural Woodwork Standards.
- P. British Standards Institution (BSI):
  - 1. BS 302 - Stranded Steel Wire Ropes.
- Q. Carpet and Rug Institute (CRI):
  - 1. CRI 104 - Standard for Installation of Commercial Carpet.
- R. Consumer Product Safety Commission (CPSC):
  - 1. CPSC 16 CPR Part 1201.
- S. Door and Access Systems Manufacturer's Association International (DASMA)
  - 1. DASMA 102 - Sectional Overhead-Type Doors
  - 2. DASMA 108 - Standard Method for Testing Sectional Garage Doors and Rolling Doors: Determination of Structural Performance Under Uniform Static Air Pressure Difference.
- T. Factory Mutual System (FM):
  - 1. FM - Approval Guide, Chapter 18 - Building Materials.
  - 2. FM Standard 4430 - Test Criteria for Heat and Smoke Vents.
  - 3. Approval Guide, Latest edition.
  - 4. FM Data Sheet 8-3, Current Edition - Rubber Tire Storage.
- U. Hydraulic Institute (HI):
  - 1. HI M103 (ANSI/HI 1.4) - Centrifugal Operations.
- V. International Association of Plumbing and Mechanical Officials (IAPMO):
  - 1. IAPMO/ANSI Z1001- Prefabricated Gravity Grease Interceptors.
- W. National Association of Architectural Metal Manufacturers (NAAMM):
  - 1. Metal Finishes Manual for Architectural and Metal Products.
- X. National Electrical Manufacturer's Association (NEMA):
  - 1. NEMA AB1 - Molded Case Circuit Breakers and Molded Case Switches.
  - 2. NEMA LD3 - High-Pressure Decorative Laminates.
- Y. National Fenestration Rating Council (NFRC):
  - 1. NFRC 100 - Procedure for Determining Fenestration Product U-Factors.
  - 2. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance of Normal Incidence.
- Z. National Fire Protection Association (NFPA):
  - 1. NFPA 13,2022 Edition - Installation of Sprinkler Systems.
  - 2. NFPA 30 - Flammable and Combustible Liquids Code.
  - 3. NFPA 30A - Automotive and Marine Service Station Code.
  - 4. NFPA 54 - National Fuel Gas Code.
  - 5. NFPA 70,2020 - National Electric Code.
  - 6. NFPA 80 - Fire Doors and Windows.
  - 7. NFPA 90A - Installation of Air Conditioning and Ventilating Systems.
  - 8. NFPA 90B - Installation of Warm Air Heating and Air-Conditioning Systems
  - 9. NFPA 96 - Ventilation Control And Fire Protection Of Commercial Cooking Operations
    - a. NFPA 101 - Code for Safety to Life from Fire in Buildings and Structures.
  - 10. NFPA 252 - Fire Tests for Door Assemblies.
  - 11. NFPA 101 - Code for Safety to Life from Fire in Buildings and Structures.
  - 12. NFPA 701 - Fire Tests for Flame Propagation of Textiles and Films.



- AA. North American Fenestration Standard (NAFS):
  - 1. AAMA\WDMA\CSA\101\I.S.2\A440 - The Voluntary Performance Specification for Windows, Doors, and Skylights.
- BB. North American Insulation Manufacturer's Association (NAIMA)
  - 1. AH 124 - Fibrous Glass Duct Liner Standard
- CC. NSF International (NSF):
  - 1. NSF 14- Plastic Piping System Components and Related Materials.
  - 2. NSF 51 - Food Equipment Materials
  - 3. NSF 61 - Drinking Water System Components-Health Effects.
  - 4. NSF 61 Annex G - Weighted Average Lead Content Evaluation Procedure to a 0.24 Percent Lead Requirement.
- DD. Occupational Safety and Health Administration (OSHA):
  - 1. OSHA 1910.23 Walking Working Surfaces.
  - 2. OSHA 1926.502 Fall Protection.
  - 3. OSHA 1926.1153 Respirable Crystalline Silica.
- EE. Plumbing and Drainage Institute (PDI):
  - 1. PDI WH 201- Water Hammer Arrestors.
- FF. Research Council on Structural Connections (RCSC):
  - 1. RCSC Specification for Structural Joints Using ASTM A 325 or A 490 Bolts.
- GG. Sheet Metal Air Conditioning Contractors National Association (SMACNA):
  - 1. SMACNA - HVAC Duct Construction Standards Metal and Flexible
- HH. Society of Automotive Engineers (SAE):
  - 1. SAE J525 - Welded and Cold Drawn Low Carbon Steel Tubing Annealed for Bending and Flaring.
 Steel Deck Institute (SDI):
  - 1. ANSI/SDI-RD Standard for Steel Roof Deck (SDI Standard).
  - 2. ANSI/SDI-NC Standard for Non-Composite Steel Floor Deck (SDI Standard).
  - 3. ANSI/SDI-C Standard for Composite Steel Floor Deck (SDI Standard).
- JJ. Steel Structures Painting Council (SSPC):
  - 1. SSPC-SP 2 - Hand Tool Cleaning.
  - 2. SSPC SP-3 - Power Tool Cleaning.
  - 3. SSPC-Paint 20 - Zinc-Rich Coating Type I - Inorganic And Type II - Organic.
  - 4. SSPC-Paint 25 - Red Iron Oxide, Zinc Oxide, Raw Linseed Oil, and Alkyd Primer.
  - 5. SSPC-Paint 20 - Zinc-Rich Coating Type I - Inorganic and Type II - Organic.
  - 6. SSPC-Paint 25 - Zinc Oxide, Alkyd, Linseed Oil Primer for Use Over Hand Cleaned Steel Type I And Type II.
  - 7. SSPC-PA 1 - Shop, Field, and Maintenance Painting of Steel.
- KK. Tile Council of North America, Inc. (TCNA):
  - 1. TCNA Handbook for Ceramic Tile Installation.
- LL. Underwriters Laboratories (UL):
  - 1. UL 10B - Fire Tests of Door Assemblies.
  - 2. UL 305 - Panic Hardware.
  - 3. UL 508 - Standard of Safety for Industrial Control Equipment.
  - 4. UL Fire Protection Directory - Latest Edition.
  - 5. UL 778 - Motor-Operated Water Pumps.
  - 6. UL 857 - Busways.
  - 7. UL Fire Protection Directory - Latest Edition

END OF REFERENCES

END OF SECTION

## APPENDIX B – TESTING, INSPECTION, AND OBSERVATION BY OWNER

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes: Administrative and procedural requirements for Owner's quality control.
- B. Owner's testing, inspection, and observation services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
- C. Unless otherwise specified, provisions specified herein are included as requirements for Owner's Construction Testing Laboratory (CTL), Owner's consultants, or other testing or inspections agencies hired by the Owner and shall be considered information only to Contractor.
  - 1. Refer to Article 2.1 for list of Sections containing responsibilities of Owner's Construction Testing Laboratory (CTL).
  - 2. Refer to Article 2.2 for list of Sections containing responsibilities of Owner's consultants or other testing or inspections agencies.
- D. Index of Sections (Quick Links): All sections listed may not be applicable to all projects.
  - 1. Section 01455 - Mechanical Equipment Testing, Adjusting, And Balancing.
- E. Related Requirements: The following list is intended to aid in locating work related to or dependent on the scope of Work in this Section. The list is included for information only and is not intended to be inclusive of all project requirements.
  - 1. Construction Contract between Walmart and Contractor: Inspections, testing, and approvals required by public authorities. Contractor obligations to perform work in accordance with Contract Documents.
  - 2. Section 01452 - Contractor Quality Control: Administrative and procedural requirements for Contractor quality assurance and quality control.
  - 3. Specifications Divisions 3 and 9: Owner's Preferred Flooring Contractor quality control procedures are located in the individual Specifications Section and not in this Appendix B.

## 1.2 REFERENCES

- A. Refer to end of Section for list. Publications are referred to within the text by the basic designation only.

## 1.3 DEFINITIONS

- A. Testing: Evaluation of systems, primarily requiring physical manipulation and analysis of materials, in accordance with approved standards.
- B. Inspection: Evaluation of systems primarily requiring observation and engineering judgment.
- C. Observation: Evaluation of systems primarily requiring observation and professional judgment.
- D. Quality Assurance: Activities, actions, and procedures performed by the Contractor before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will substantially comply with construction documents.
- E. Quality Control: Tests, inspections, procedures, and related actions performed by the Contractor during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction substantially comply with construction documents.
- F. Construction Testing Laboratory (CTL): The independent testing and inspection agency employed by the Owner.

- G. Contractor: The General (prime) Contractor for the Project. Also referred to as GC.
- H. Architect of Record (AOR): The prime consultant in charge of overall design and coordination of the building.
- I. Engineer of Record (EOR): The Registered Engineer in responsible charge of engineering design for the project.
- J. Refrigeration Engineer of Record (REOR): The registered engineer in responsible charge of refrigeration engineering design for the project.
- K. Structural Engineer of Record (SER): The Registered Engineer in responsible charge of the structural design for the project.
- L. Civil Engineering Consultant (CEC): The Registered Engineer in responsible charge of the civil design for the project.
- M. Fire Protection Consultant: Consultant that provides professional design services and construction documents related to fire protection for the project.
- N. Architect - Engineer (A/E): A collective term to include the AOR, CEC, SER, and the Mechanical, Electrical, Refrigeration, and Fire Protection EOR.
- O. Independent Test and Balance Agency (ITBA): The Independent HVAC test and balance company employed by the Owner.
- P. Building Official: The Officer or his duly authorized representative charged with the administration and enforcement of the local building code.
- Q. Special Inspector (SI): The Special Inspector under the direct supervision of a registered civil/structural engineer (unless otherwise specified) regularly engaged in inspection, and experienced with the type of work requiring related testing and inspection. The categories of special inspector are:
  1. Technical I (TI): A Technician who is an employee of a qualified and approved testing laboratory. Lab work shall be performed in a qualified testing laboratory.
  2. Technical II (TII): A Technician with a minimum of 2 years' experience, or a graduate engineer, and is an employee of a qualified and approved testing laboratory.
  3. Technical III (TIII): An engineer regularly engaged in related work with a minimum of 4 years of experience, licensed in the State in which the project is located, and is an employee of a qualified and approved testing laboratory. This licensed engineer shall review and approve all final field reports.
  4. Structural I (StI): A graduate civil/structural engineer, or other trained and experienced personnel acceptable to the SER, with experience in the testing and inspection of related structural systems.
  5. Structural II (StII): A civil/structural engineer regularly engaged in related work with a minimum of 4 years of experience, licensed in the State in which the project is located. The licensed engineer shall review and approve all inspection reports.
  6. Independent Roofing Inspector (IRI): A technician employed or subcontracted by the CTL for the purpose of field observation of roofing installation. The IRI shall be certified as a Registered Roofing Observer (RRO) by the Institute of Roofing, Waterproofing, and Building Envelope Professionals (RCI) (Formerly Roof Consultants Institute).
  7. Roofing Technician: A technician employed by the CTL with training and experience in roofing construction or inspection. The Roofing Technician shall be under the direct supervision of the IRI and shall provide continuous inspection during roofing work.
  8. Unique special inspector requirements, for specific materials and system, are noted in related technical specification sections.
- R. Continuous Inspection: The full-time observation of work requiring inspection by an approved Special Inspector who is present in the area where the work is being performed.
- S. Periodic Inspection: The part-time or intermittent observation of work requiring inspection by an approved Special Inspector who is present in the area where the work has been or is being performed and at the completion of the work.

- T. Deviation: Any item or component of work that does not substantially conform to the requirements of the construction plans and/or specifications and which has not been corrected by the end of business on the day it is identified. A life-safety deviation is any construction deviation that poses a serious hazard to any person.

#### 1.4 CONSTRUCTION TESTING LABORATORY (CTL) QUALITY REQUIREMENTS

- A. CTL shall comply with requirements of ASTM C 1077, ASTM C 1093, ASTM D 3740, ASTM D 3666, ASTM E 329, ASTM E 543, ASTM E 699, and AASHTO R18.
- B. CTL shall be authorized to operate in state in which Project is located.
- C. CTL Testing Equipment shall be calibrated at reasonable intervals with devices of an accuracy traceable to either National Institute of Standards and Technology (NIST) standards or accepted values of natural physical constants.
- D. CTL shall have and maintain a written Quality Manual (QM) for its laboratory conforming to the Appendix requirements ASTM E 329 or AASHTO R18. The QM shall be available for review by the Owner's Construction Manager upon request. The QM shall be organized similar to Quality Manual Requirements of AASHTO R18 and include the following:
  - 1. Organization and Organizational Policies.
  - 2. Staff.
  - 3. Equipment.
  - 4. Test Data Control and Reports.
  - 5. Diagnostic and Corrective Action.
  - 6. Internal Quality System Review.
  - 7. Subcontracting.
  - 8. Statement certifying compliance with ASTM standards specified above.

#### 1.5 OWNER RESPONSIBILITIES

- A. Employment and payment for services of the Construction Testing Laboratory (CTL), Special Inspector (SI), and other third party testing, inspection, and observation firms to perform specified testing and inspecting will be by the Owner under separate contract.
- B. The Owner will perform testing and inspection (T & I) but only as a means to satisfy the Owner of contract compliance and as assurance to the Owner of Contractor quality control performance.
- C. Owner T&I specified herein below will be performed by the Owner's Construction Testing Laboratory (CTL) unless otherwise specified.

#### 1.6 CONSTRUCTION TESTING LABORATORY AND SPECIAL INSPECTOR RESPONSIBILITIES

- A. Responsibilities include inspections, tests, and related actions including reports performed by testing or inspection service. They do not include Contract enforcement activities performed by the Owner's Construction Manager or authorities having jurisdiction.
  - 1. Provide the Architect of Record a copy of the contractual provisions defining the CTL's and SI's scope of services.
- B. The CTL/SI representative shall attend a pre-construction meeting prior to actual start of the Project. Except for the roofing inspection, the CTL/SI representative shall be the Registered Professional Engineer assigned to the project.
- C. Maintain a copy of Contract Drawings and Specifications with all Addenda and Change Orders. Use the Contract Documents supplemented by the approved shop drawings and applicable material and workmanship provisions of the Code for testing and inspection of the work.
- D. Provide qualified personnel at site to comply with schedule and submit reports for each test and inspection as defined hereinafter. Testing and inspection, except roofing inspection, shall be under supervision of the Registered Professional Engineer (P.E.) in the state where Project is located.

- E. Perform specified inspection, sampling, and testing of work, materials, and equipment in accordance with specified standards.
- F. Ascertain compliance of materials and mixes with requirements of Contract Documents.
- G. Perform testing and inspections in a timely manner to avoid delay of work. Schedule and coordinate testing and inspections with Contractor and appropriate sub-contractors and installers.
- H. Coordinate and consolidate specified testing and inspection to be concurrent, to the maximum extent practicable, during each required site visit in order to minimize number of visits.
- I. If observed deviations from the Contract Drawings, Specifications, or building code will be probable cause of subsequent rejection of work or material, notify Contractor, the Owner's Construction Manager, Sitework Engineering Consultant, and Architect of Record, sufficiently in advance for determination to continue operations or take corrective measures before continuing. If uncorrected after a reasonable period of time, bring the situation to the attention of the Structural Engineer of Record, the Building Official, and to the Architect of Record.
- J. Track resolutions and remedial repairs to deviations and subsequent conformance to the Contract Documents on the Observation Log.
- K. Report any observed life safety issue immediately to Contractor and Owner's Construction Manager. After notification is given to the Contractor and the Owner's Construction Manager, the CTL/SI shall also log the life safety issue on Owner's Observation Log.
- L. Perform retesting due to non-conformance with the Contract Documents based on CTL testing.
- M. Provide a final conformance letter to Owner, SER, AOR and, if determined to be required, the AHJ. An example is attached at the end of this Appendix. CTL shall upload an electronic pdf file to Owner's online project document delivery application *Lucernex*.
- N. Testing and inspection by the Building Official do not preclude the normal field involvement and site observations by Architect or Structural Engineer of Record, nor shall it relieve the Contractor of any responsibility to complete the work in accordance with the approved drawings and specifications.
- O. Construction Testing Laboratory And Special Inspector Limits On Authority: The CTL or SI may not:
  - 1. Release, revoke, alter, or enlarge on requirements of Contract Documents.
  - 2. Approve or accept any portion of the Work.
  - 3. Assume any duties of Contractor.
  - 4. Stop the Work.
- P. Testing and inspecting services performed by the CTL (Construction Testing Laboratory) are required to verify compliance with requirements specified or indicated.
  - 1. CTL services do not relieve Contractor of responsibility for compliance with the Contract Document requirements nor limit Contractor's quality assurance and quality control procedures that facilitate compliance with the Contract Document requirements.
  - 2. Specific testing and inspection requirements for individual construction activities shall be as specified in the individual Appendix Sections.
  - 3. Requirements for Contractor to provide quality assurance and quality control services required by Architect, Owner, Construction Manager, or authorities having jurisdiction do not limit responsibilities of the CTL.

#### 1.7 ROOF OBSERVATION PROGRAM

- A. The CTL shall develop a comprehensive Roof Observation Program to be administered by the IRI outlining the specific activities and details of roofing site observations and to be implemented in accordance with Section 07530. The program shall conform and implement the requirements of ASTM D 7186 including the applicable forms therein.

#### 1.8 CONTRACTOR RESPONSIBILITIES

- A. Cooperate with CTL/SI and other third party personnel, and provide access to the Work and to manufacturer's facilities.
- B. Provide incidental labor and facilities to provide access to Work to be tested, to obtain and handle samples at the site or at source of products to be tested, to facilitate tests and inspections, and to provide storage and curing of test samples. Provide lift equipment as required for inspection personnel of the Owner or the Owner's representatives.
- C. Provide CTL 24 hour notice prior to expected time for operations requiring inspecting and testing services.
- D. Notify in writing the Owner's Construction Manager three working days prior to expected time for operations requiring inspecting and testing services.
- E. Provide the CTL/SI with access to the internet for the purpose of logging deviations into Owner's online project document delivery application *Lucernex*.

## 1.9 REPORTS

- A. The CTL or other Owner's testing or inspection firm shall submit reports for T&I and other items as required herein.
- B. CTL Information: Testing laboratory name, address, and telephone number, and names of full time Registered Engineer and responsible officer.
- C. Roof Observation Program.
- D. Test and Inspection Reports:
  - 1. Submit test and inspection reports showing the following information:
    - a. Date issued.
    - b. Project title and number.
    - c. Store number.
    - d. Firm name, address and telephone number
    - e. Name of responsible officer(s).
    - f. Name and signature of tester or inspector.
    - g. Name and seal of registered engineer in responsible charge (as applicable).
    - h. Date and time of sampling.
    - i. Date of test or inspection.
    - j. Identification of product and specification section.
    - k. Location in project, including elevations, grid location and detail.
    - l. Type of test or inspections.
    - m. Results of tests or inspections and interpretation of same.
    - n. Observations regarding compliance with Contract Documents or deviations therefrom.
- E. Submit required reports and other items to the following:
  - 1. CEC: 1 copy. (Site work T&I only)
  - 2. SER: 1 copy (Construction Administration Leader) (Bldg T&I only)
  - 3. AOR: 2 copies (Construction Administration Leader).
  - 4. Contractor: 3 copies.
  - 5. Building Official: Quantities as required.
- F. Submit a separate final signed report stating the work requiring inspection is, to the best of the inspector's knowledge, in conformance with the Contract Documents.
- G. Reports shall be made on 8-1/2 by 11 white paper, suitable for photocopying and binding in booklet form. Sheets shall have the testing/inspection firm's letterhead (including phone number and address). Larger sheets shall be folded and bound into the booklet.
- H. Submit Test and Inspection Reports within 3 working days of T&I occurrence. CTL shall also upload an electronic pdf file to Owner's online project document delivery application *Lucernex*.

- I. Tests and inspections indicating non-conformance (deviations) to the Contract Documents shall be brought to the attention of the Contractor, Sitework Engineering Consultant, and Architect of Record upon discovery in the form of hard copy reports and entered into the Owner’s Observation Log within 24 hours.
- J. Deviations from the Contract Documents, as defined above, shall be logged into the Observation Log by the CTL/SI representative in Owner’s online project document delivery application *Lucernex*.
- K. Owner’s Construction Manager in conjunction with the CTL and/or SI will determine when to involve the AOR or EOR for remedial action.

PART 2 - and PART 3 - PRODUCTS and EXECUTION

2.1 TESTING AND INSPECTION BY OWNERS CONSTRUCTION TESTING LABORATORY (CTL)

- A. General Requirements: The CTL is a group of agencies who may be included for various tests and inspections depending on project scope. CTL scope is listed corresponding to section numbers of the Specifications. Where CTL scope is included (checked ‘Y’ box), refer to individual Section requirements in the body of Appendix B.
  - 1. Section 02300 - Earthwork Y  N
  - 2. Section 02320 - Excavating, Backfilling and Compacting Y  N
  - 3. Section 02340 - Soil Stabilization Y  N
  - 4. Section 02467 - Drilled Concrete Piers and Shafts Y  N
  - 5. Section 02621 - Foundation Drainage Piping Y  N
  - 6. Section 02715 - Base Course Y  N
  - 7. Section 02740 - Asphalt Concrete Paving Y  N
  - 8. Section 02751 - Concrete Paving Y  N
  - 9. Section 02900 – Planting Y  N
  - 10. Section 03310 - Structural Concrete and Exterior Concrete Slabs Y  N
  - 11. Section 03314 - Cast-in-Place Concrete Slabs (Interior) Y  N
  - 12. Section 04200 - Unit Masonry Assemblies Y  N
  - 13. Section 05090 - Concrete and Masonry Anchors Y  N
  - 14. Section 05120 - Structural Steel Y  N
  - 15. Section 05210 - Steel Joists Y  N
  - 16. Section 05300 - Metal Deck Y  N
  - 17. Section 05400 - Cold Formed Metal Framing Y  N
  - 18. Section 07243 - Water-Drainage Exterior Insulation and Finish System (EIFS) Y  N
  - 19. Section 09511 - Acoustical Panel Ceilings Y  N
  - 20. Tests and inspections shall, as a minimum, be performed by Technical I (TI) inspector if not otherwise specified in the individual section.
  - 21. If inspection of fabricators’ work is required, the Owner’s representative may require testing and inspection of the work at the plant before shipment.
  - 22. Testing and inspection shall be performed in accordance with the industry standard used as the reference for the specific material or procedure unless other criteria are specified. In the absence of a referenced standard, tests shall be accomplished in accordance with generally accepted industry standards.
  - 23. Work shall be checked as it progresses, but failure to detect any defective work or materials shall in no way prevent later rejection if defective work or materials are discovered, nor shall it obligate Owner to accept such work.
- B. Testing or inspection in addition to that specified herein, may be performed by the CTL as directed by the Owner for in-place work as further verification of Work or as verification of Contractor performed Quality Control testing and inspection.

2.2 OBSERVATION BY PROFESSIONALS OF RECORD

- A. Observation by Owner’s Professionals of Record (POR). Professionals of Record include the following as defined in Part 1:
  - 1. Architect (AOR)



2. Structural Engineer (SER)
3. Mechanical or Electrical Engineer (EOR).
4. Refrigeration Engineer (REOR).
5. Fire Protection Engineer (EOR).
6. Civil Engineer (CEC).

B. Sections herein related to POR observation include the following (refer to individual Section requirements specified hereinafter):

1. Section 01454 - Architect Engineer Site Observation
2. Section 01456 - Civil Engineering Consultant Site Observation.
3. Section 13900 - Fire Suppression
4. Section 15600 - Refrigeration Systems.
5. Section 15700 - Heating, Ventilating, and Air Conditioning Equipment.

2.3 TESTING, INSPECTION, AND OBSERVATION BY OWNER’S INDEPENDENT INSPECTORS

A. The following Sections include testing, inspection, or observation by an independent agency selected and paid for by Owner .Refer to individual Section requirements in the body of Appendix B.

1. Section 03531 – Architectural Concrete Overlay: Owner’s Independent Concrete Consultant (ICC).
2. Section 07530 - Elastomeric Membrane Roofing: Owner’s Independent Roofing Inspector (IRI).
3. Section 07550 - Modified Bituminous Membrane Roofing: Owner’s Independent Roofing Inspector (IRI).
4. Section 11400 - Food Service Equipment: Food Service Equipment Supplier or Owner Furnished Equipment Manufacturer’s Representative.
5. Section 14420 – Wheelchair Lifts: Owner’s Vertical Transportation Consultant (VTC).
6. Section 16050 – Basic Electrical Materials and Methods: Owner’s Independent Power Systems Study Engineer (PSSE).

**SECTION 01454 - ARCHITECT-ENGINEER SITE OBSERVATION**

2.1 CONTRACTOR AND OWNER COORDINATION AND SCHEDULING

- A. Contractor Responsibilities are specified in Specification Section 01454.
- B. Owner’s Architect-Engineers (A/E) will perform site observation at no cost to the Contractor.

2.2 QUALITY ASSURANCE OBSERVATION

A. The A/E will perform construction site observations as agreed to with the Owner as scheduled below or as otherwise requested by the Authority Having Jurisdiction or Owner’s Construction Manager to check a sample of the constructed Work for general conformance with the Contract Documents.

1. The A/E will coordinate with the Contractor and CM/MCM and monitor construction progress remotely through Owner’s online construction progress application *HoloBuilder* to determine the appropriate time to schedule required visits.

A/E CONSULTANT SITE OBSERVATION/FPT (SITE VISIT) SCHEDULE

Construction Occurrence / Discipline	Foundation/ Masonry	Structural Steel	Mid- Construction	Possession	Grand Opening
Architectural				1st	
Structural			1st		
Fire Protection			1st	2nd	
Mechanical/Electrical					FPT
Mechanical			1st	2nd	
Electrical			1st	2nd	

Construction Occurrence / Discipline	Possession	Functional Testing
Architectural	1st	
Fire Protection	1st	
Mechanical/Electrical	1st	FPT
Refrigeration	1st	FPT

B. Owner's A/E Consultant Quality Assurance Observation:

1. AOR:
  - a. Observations as shown in A/E Consultant Site Observation/FPT (Site Visit) Schedule herein, and/or as required by the Authority Having Jurisdiction or as directed by Owner.
2. EOR:
  - a. Observations as shown in A/E Consultant Site Observation/FPT (Site Visit) Schedule herein, and/or as required by the Authority Having Jurisdiction or as directed by Owner.
3. SEOR:
  - a. Observations as shown in A/E Consultant Site Observation/FPT (Site Visit) Schedule herein, and/or as required by the Authority Having Jurisdiction or as directed by Owner.
4. REOR:
  - a. Two to four weeks prior to Re-Grand Opening and/or Construction Completion, whichever is earlier, as scheduled by the Owner's Construction Manager.
5. Fire Protection Consultant:
  - a. One week prior to date of construction completion. Refer to Section 13900.

C. Specific items to be witnessed during the construction site observation (including but not limited to) are listed below in more detail by discipline to assist in scheduling the site observation at the proper time.

D. Architectural: Architectural consultant site observation shall be by a competent representative of the AOR having complete knowledge of the project.

1. Observe construction in progress and work completed, to determine if project is being constructed to meet the requirements of the Construction Documents.
2. Review architecturally related construction documents currently used by the Contractor to assure that revisions and Construction Change Directives are incorporated and executed.
3. Complete Construction Observation Report and upload completed report and accompanying photographs to Owner's online project document delivery application *Lucernex*. Upload location is Store folder/Project folder/Store Planning & Construction/Construction Observation.

E. Structural:

1. Verify vertical reinforcing, control joint placement, foundation sizes, anchor bolt placement, CMU placement, grouting procedures, vertical and horizontal reinforcing, structural steel connections, roof decking attachment, and grouting of voids.
2. Additional visits shall be as required to review repair of previous deviations.

F. Fire Protection:

1. Verify the fire sprinkler systems are in conformance with the Contract Documents and shop drawings, review sprinkler head locations, main and branchline installation, and system testing.

G. Testing and inspections by the Building Official shall not preclude the normal field involvement and site observations by the A/E, nor will it relieve the Contractor of any responsibility to complete the work in accordance with the approved drawings and specifications.

H. The A/E shall not have control over or responsibility for construction means, techniques, sequences of operations or for safety programs and procedures in connection with the construction work.

- I. Work will be checked as it progresses, but failure to detect defective work or materials shall in no way prevent later rejection if defective work or materials are discovered, nor shall it obligate Owner to accept such work.

## 2.3 FUNCTIONAL PERFORMANCE TESTING (FPT)

- A. FPT by Owner's Refrigeration Consultant (REOR): The Owner's Refrigeration Consultant (REOR) will perform Functional Performance Testing as specified in A/E Consultant Site Observation/FPT (Site Visit) Schedule to check the refrigeration system work for functional operation and general conformance with the Contract Documents, including the following:
  1. Refrigeration Cases: Remotely perform Auto-FPT procedure on all equipped controllers. Review report and denote deficiencies based on failed tests, case/coil performance history, and nonconformance with construction documents.
- B. The REOR will submit applicable Walmart Building Performance Verification Program FPT Report Forms as included at the end of this Appendix.
- C. FPT by Owner's Mechanical Consultant (EOR): The Owner's Mechanical Consultant (EOR) will perform Functional Performance Testing as specified in A/E Consultant Site Observation/FPT (Site Visit) Schedule to check the mechanical work for functional operation and general conformance with the Contract Documents, including the following:
  1. Test operation and control of selected mechanical HVAC equipment.
  2. EOR will perform FPT one week prior to Re-Grand Opening and / or Construction Completion as scheduled by the Owner's Construction Manager.
  3. The EOR will submit applicable Walmart Building Performance Verification Program FPT Report Forms as included at the end of this Appendix.
  4. The REOR will perform the FPT as agreed to with the Owner as specified above to check the refrigeration system work for functional operation and general conformance with the Contract Documents.
- D. The A/E shall monitor the construction schedule and coordinate with the Contractor at least 21 days prior to scheduled date of construction completion to schedule site visits to occur at the most appropriate time. The A/E shall notify the Contractor and Owner's Construction Manager 14 days in advance of the date and time of each scheduled site visit.

## 2.4 DEFICIENCY PROVISIONS

- A. The observation and FPT site visits listed above are to be performed at Owner's expense. Should there be outstanding items of non-conformance with the Contract Documents that warrant additional site visits to be performed by the A/Es, the A/Es shall receive approval from Owner prior to performing additional construction site observations or FPTs until all deviations have been corrected by the Contractor and closed by the A/E. Reimbursement by the Contractor for costs for additional A/E site visits will be as specified in Section 01452.
- B. Deviations from the Contract Documents shall be entered into Owner's online construction management system *Wrike* by the Engineers of Record within five (5) days of completing each site observation visit and the FPT and will be tracked and noted by the consultants when resolved by subsequent conformance by the Contractor.
  1. Deviations not resulting in remediation or correction by the Contractor may be submitted to the Deviation Resolution Process as described herein below.
- C. Deviations observed by the AOR will be noted in the Construction Observation Report. Construction Observation Report and photos will be uploaded location in Owner's online project document delivery application *Lucernex*.
- D. Deviation Resolution Process: As an alternative to Contractor's correction of a noted deviation, Owner's Construction Manager may exercise discretion in accepting a deviation without a site visit by the EOR if the deviation is not a life safety issue or code requirement. Owner's CM and Contractor may coordinate to resolve a deviation as follows.
  1. Contractor's Statement of Deviation Resolution: To initiate a deviation resolution, Owner's CM will coordinate with Contractor for Contractor to generate an email communication to the CM entitled "Statement of Deviation Resolution," including the following information:
    - a. Subject Line: Store number, city and state, and deviation number.
    - b. Included Parties: Email communication shall copy CM, EOR, AOR, and Owner's Director of Design and Project Management.

- c. Body: Deviation description, including CM's recommendation and proposed resolution.
  - d. Other Data: As instructed by the CM or required for other reasons as determined by Owner, photographs or other documentation.
2. Owner Approval of Deviation Resolution:
    - a. Owner's CM/MCM will indicate Approved in the body of the email and forward to their Director for approval.
    - b. Owner's Construction Director will indicate Approved in the body of the email and forward to the AOR and EOR that created the deficiency and cc: the PMO Director.
    - c. Owner's Director of Design and Project Management will review Contractor's Statement of Deviation Resolution, reply to all with requests for clarifications and information from Owner's CM, and declare a disposition.
  3. The EOR will upload the Statement of Deviation Resolution to *Wrike*, note Owner's final disposition, and mark the deviation as corrected/completed.
  4. After final disposition upon the Statement of Deviation Resolution, EOR disagreements or concerns regarding the final disposition shall be addressed by the Construction Director and the Owner's Construction team.

## **SECTION 01455 - MECHANICAL EQUIPMENT TESTING, ADJUSTING, AND BALANCING**

### **2.1 CONTRACTOR AND OWNER COORDINATION AND SCHEDULING**

- A. Contractor Responsibilities are specified in Specification Section 01455.
- B. Employment and payment for services of an Independent Test and Balance Agency (ITBA) to perform specified testing and balancing of environmental systems will be by Owner, except as otherwise specified.

### **2.2 TESTING, ADJUSTING, AND BALANCING BY ITBA**

- A. Testing and balancing shall be supervised by a Registered Professional Engineer. Personnel involved in execution of the work for ITBA shall be technicians experienced and trained specifically in testing and balancing of mechanical systems. Instruments used by ITBA shall be recently and accurately calibrated and maintained in good working order. Verification of equipment calibration shall be submitted in final test report if requested by Owner. Test, adjust, and balance specified equipment in accordance with governing NEBB or AABC Procedural Standards.
- B. Procedures:
  1. Make preliminary system check on mechanical, control, and Building Automation Systems and equipment to be tested to determine that equipment, duct work, etc. is installed and will operate. Deficiencies shall be immediately reported to Contractor's job site superintendent and the Owner Mechanical Construction Manager.
  2. Air Side Testing And Balancing: Perform the following air side testing and balancing for RTUs, AHUs, DOAS, WSHPs, exhaust fans and exhaust hoods. Record readings for inclusion into final report:
    - a. Record unit manufacturer, model number, and unit number.
    - b. Test and adjust fan speeds to deliver design CFM and record for each unit.
    - c. Test and adjust system for design CFM outside air.
    - d. Measure and record unit voltage, amperage and fan speeds and final operating conditions.
    - e. Test and record supply and return external static pressures at respective plenums. Seal access holes with rubber or metal snap-in plugs. The use of duct tape to seal access holes will not be permitted.
    - f. Test and adjust the volume dampers in the main duct runs to each diffuser, grille, and register to provide  $\pm 10\%$  of design CFM requirements.
    - g. Identify each diffuser, grille, and register location and area.
    - h. Provide AHU unit static pressure profile including unit suction static pressure, fan suction static pressure, and fan discharge static pressure.
  3. Refrigeration Racks:
    - a. Record unit manufacturer, model number, and unit number.
    - b. Measure and record water supply pressure at inlet to control valve.
    - c. Measure and record pressure drop across heat exchanger.
    - d. Measure and record differential temperature across heat exchanger.
    - e. Set to design flow and record water flow.

7. If any system or outlet is not within +/- 10 percent of design capacity at design rpm, determine the reason. Check duct work and plenums for leaks; coils, filter, for excessive pressure drop, etc.; and list on HVAC Deficiency Report.
- C. Reports:
1. Testing and balancing data, measurements, reading, verification, settings, and deficiencies shall be recorded and compiled in a complete report. Record data on applicable NEBB or AABC certified reporting forms. Report shall include summary sheet of deficiencies with status (corrected or not corrected at time of report) and recommendations.
  2. Upload report to Owner's online construction management system *Wrike* within seven days after final test and balance.
  3. Before leaving job site, ITBA shall provide to the Contractor, a list of remaining HVAC system deficiencies for correction.

## **SECTION 01456 – CIVIL ENGINEERING CONSULTANT SITE OBSERVATION**

### **SECTION 02300 - EARTHWORK**

#### **SECTION 02320 - EXCAVATING, BACKFILLING, AND COMPACTING**

##### 2.1 SOURCE QUALITY CONTROL

- A. Following tests shall be performed on each type of on-site or imported soil material used as compacted fill:
1. Moisture and Density Relationship: ASTM D 698 or ASTM D 1557.
  2. Mechanical Analysis: AASHTO T 88 or ASTM D422.
  3. Plasticity Index: ASTM D 4318

##### 2.2 OWNER TESTING AND INSPECTION (T&I) AND OBSERVATION

- A. Field testing, frequency, and methods may vary as determined by and between the Owner and the CTL.
- B. Work shall be performed by a Special Inspector - Technical I unless specified otherwise. Report of testing and inspection results shall be made upon the completion of testing.
- C. Classification of Materials: Perform test for classification of materials used and encountered during construction in accordance with ASTM D2488 and ASTM D2487.
- D. Laboratory Testing Of Materials: Perform laboratory testing of materials (Proctor, Sieve Analysis, Atterberg Limits, Consolidation Test, etc.) as specified.
- E. Field Density Tests
1. Utility Trench Backfill: Intervals not exceeding 30-feet of trench for first and every other 8-inch lift of compacted trench backfill.
  2. Test Method: In-place nuclear density, ASTM D6938.
- F. Observation and Inspection:
1. Observe all subgrades/excavation bases below footings and slabs and verify design bearing capacity is achieved as required. Work shall be performed by a Special Inspector - Technical II.
  2. Observe and document presence of groundwater within excavations.

##### 2.3 RETESTING AND RE-INSPECTION BY OWNER CTL

- A. CTL will conduct retesting and re-inspection as necessary until corrections are fully completed by the Contractor.

### **SECTION 02340 - SOIL STABILIZATION**

### **SECTION 02621 - FOUNDATION DRAINAGE PIPING**

2.1 OWNER TESTING AND INSPECTION (T&I)

- A. Owner T&I will be performed by the Owner's Construction Testing Laboratory (CTL).
- B. Test drainage system backfill in accordance with utility trench backfill specified in Specifications Section 02300.

**SECTION 02715 - BASE COURSE**

**SECTION 02740 - ASPHALT CONCRETE PAVING**

**SECTION 02751 - CONCRETE PAVING**

**SECTION 02900 - PLANTING**

**SECTION 03310 - STRUCTURAL CONCRETE AND EXTERIOR CONCRETE SLABS**

2.1 OWNER TESTING AND INSPECTION (T&I):

- A. Owner T&I will be performed by the Owner's Construction Testing Laboratory (CTL).
- B. CTL will perform tests and inspections as specified herein and in Tables A and B hereinafter.
- C. CTL will keep records of the testing and inspections.
- D. CTL is neither authorized to change any specified requirement nor to approve any portion of the work.
- E. Failure to detect defective material or Work will neither prevent rejection when defects are discovered later nor will it obligate Owner to make final acceptance.
- F. Qualifications: Unless otherwise specified, work shall be performed by a Special Inspector - Technical II or Special Inspector - Structural I. In addition to the Inspector and CTL qualifications specified in this Section, the following qualifications shall apply for all Cast-in-Place Concrete inspections.
  - 1. Technical I: ACI Certified Grade I inspector.
  - 2. Technical II: ACI Certified Grade II inspector.
  - 3. CTL: C.C.R.L. certification at the National Bureau of Standards. (For multi-story projects only).
  - 4. Lead technician shall have at least five years' experience in projects of this size and complexity.
  - 5. Other technicians shall have at least two years' experience.
- G. Review the Contractor's proposed materials and mix design for conformance with specifications.
- H. Perform testing and inspections in accordance with ACI 301 and testing standards listed in this Section.
- I. Field Testing:
  - 1. Compressive Strength: Make cylinder sets for compressive strength testing per ASTM C31 at the following frequency:
    - a. Building Foundations: Once each day a given mix design is placed, and not less than once for each 150 cubic yards of each mix placed each day, nor less than once for each 5,000 square feet of each mix for wall or slab surface area placed each day.
    - b. Retaining Walls. Once each day a given mix design is placed, and not less than once for each 150 cubic yards of each mix placed each day, nor less than once for each 5,000 square feet of each mix for wall surface area placed each day. Only one side of the wall shall be considered when calculating surface area.
  - 2. Slump, Air Content, Temperature and Unit Weight: Conduct slump, air content, temperature, and unit weight tests as follows:
    - a. Test Methods:
      - 1) Slump - ASTM C143.
      - 2) Air content - ASTM C173, C 231 or C 138. Indicate test method on report.
      - 3) Concrete materials temperature - ASTM C1064.

- 4) Unit weight - ASTM C138.
- b. Test Frequencies:
  - 1) Building Foundations: Conduct tests when concrete is sampled for compressive strength testing. Notify the Owner's Construction Manager upon failure of any second failing test.
  - 2) All Other Concrete Placed:
    - a) Perform slump and temperature tests for first truck load of concrete and every other truck thereafter. If the initial slump and temperature fails, make additional slump and temperature tests for every other load from a stationary mixer or truck to test consistency. Test temperature hourly when air temperature is 40 F and below or 80 F and above. Provide test reports to Owner's Construction Manager.
    - b) Perform air test for first truck and every 27 cubic yards minimum thereafter. Make test at same time as slump test. If initial test fails, perform air test in every other load to insure consistency. Provide test reports to Owner's Construction Manager and other involved parties.
  - 3) When Type F fly ash is used and concrete is exposed to weather, perform air content test for first and second truck for each mix of concrete placed each day. If either test fails, perform air content test on every truckload until two consecutive air content tests comply with specified requirements.
  - 4) Conduct temperature test hourly when air temperature is 40 degrees F and below or 80 degrees F and above.
  - 5) Determine temperature of concrete sample and ambient air for each strength test.
  - 6) When pumping concrete, take samples for slump tests at point of delivery from pumping line in addition to first slump test noted above for concrete with mid-range or high-range water-reducer.
3. Note trends of decreasing quality in concrete due to changing seasons, conditions of curing, or other causes and bring to attention of the Owner's Construction Manager. Report and log comments on Non-Conformance Correction Log.
4. Report any significant deviations from approved mix design including temperature, moisture and condition of aggregate.

J. Laboratory Testing Requirements:

1. Test items such as reinforcing steel, aggregates, and other products suspected of not meeting specified requirement as directed by Owner's Construction Manager to verify compliance. Provide test report to Owner's Construction Manager. In-place tests in accordance with ASTM C 42 shall be conducted as directed by the Owner's Construction Manager when specified concrete strengths and other characteristics have not been attained in the structures.
2. In-place tests in accordance with ASTM C 42 shall be conducted as directed by the Owner's Construction Manager when specified concrete strength and other characteristics have not been attained in the structures.
3. Strength Tests:
  - a. Secure composite samples in accordance with ASTM C 172. Sample at regularly spaced intervals from middle portion of the batch. Sampling time shall not exceed 15 minutes.
  - b. Mold and cure specimens in accordance with ASTM C 31.
    - 1) During the initial 24 hours (plus or minus 8 hours) after molding, the temperature immediately adjacent to the specimens shall be maintained in the range of 60 to 80 degrees F. Control loss of moisture from the specimens by shielding from the direct rays of the sun and from radiant heating devices.
    - 2) Specimens transported prior to 48 hours after molding shall not be demolded, but shall continue initial curing at 60 to 80 degrees F until time for transporting.
    - 3) Specimens transported after 48 hours age shall be demolded in 24 hours (plus or minus 8 hours). Curing shall then be continued but in saturated limewater at 73.4 degrees (plus or minus 3 degrees F) until the time of transporting.
    - 4) During transportation, protect the specimens with suitable cushioning material to prevent damage from jarring. During cold weather, protect specimens from freezing with suitable insulation material. Transportation time shall not exceed four hours.
    - 5) Date test cylinders and number consecutively. Give each cylinder of each set an identifying letter (i.e. A, B, C, D). Prepare a sketch of the building plan for each test set identifying location of placed concrete.
  - c. Test cylinders in accordance with ASTM C 39.

- 1) Test one cylinder (A) at 7 days for information. If the compressive strength of the concrete sample is equal to or above the 28 day specified strength, test another cylinder (B) at 7 days. The average of the breaks shall constitute the compressive strength of the concrete sample.
- 2) Test two cylinders (B and C) at 28 days and the average of the breaks shall constitute the compressive strength of the concrete sample.
- 3) Retain fourth cylinder (D) for further testing if needed, but do not retain cylinder more than 60 days.

K. Reporting:

1. Record the following information as applicable on reports and submit to Owner's Construction Manager and others as specified in this Section:
  - a. Test cylinder number and letter.
  - b. Specific foundations or structures covered by this test.
  - c. Proportions of concrete mix or mix identification.
  - d. Maximum size coarse aggregate.
  - e. Specified compressive strength.
  - f. Tested compressive strength.
  - g. Slump.
  - h. Air content.
  - i. Concrete temperature.
  - j. Concrete plastic unit weight.
  - k. Elapsed time from batching at plant to discharge from delivery truck at project.
  - l. Date and time concrete was placed.
  - m. Ambient temperature, wind speed, and relative humidity during concrete placement.
  - n. Name of technician securing samples.
  - o. Curing conditions for concrete strength test specimens (field and laboratory).
  - p. Date strength specimens transported to laboratory.
  - q. Age of strength specimens when tested.
  - r. Type of fracture during test.
2. Field Test Reports: Submit reports of field tests and inspections to Owner's Construction Manager and others as specified in this Section.

L. Inspections: Conduct inspection below for pedestals, walls, and foundations supporting CMU, precast and concrete walls and retaining walls only.

1. Concrete Form Work:
  - a. Verify formwork dimensions will result in member size and configuration shown.
  - b. Structural adequacy of formwork is the sole responsibility of the Contractor.
2. Concrete Reinforcement:
  - a. Verify reinforcing bar grade.
  - b. Verify reinforcing bars are free of dirt, excessive rust, and damage.
  - c. Verify reinforcing bars are adequately tied, chaired, and supported to prevent displacement during concrete placement.
  - d. Verify proper clear distances between bars and to surfaces of concrete.
  - e. Verify reinforcing bar size and placement.
  - f. Verify bar laps for proper length and stagger.
3. Embedded Items:
  - a. Verify specified size, type, spacing, configuration, embedment length, and quantity of anchor bolts and embedded items.
  - b. Verify proper concrete placement and means have been taken to achieve consolidation around bolts and embedded items.
4. Concrete Foundations Structural Inspections: Inspect foundations and report on the following:
  - a. Concrete footing size and depth.
  - b. Footing bar size, spacing, and placement (cover).
  - c. Placement and vibration of concrete.
  - d. Dowel bar size, orientation, embedment, and spacing.
5. Concrete Mix:
  - a. Verify mixer truck trip ticket conforms to approved mix design.
  - b. Verify that total water added to mix on site does not exceed that allowed by concrete mix design.



- c. Verify that concrete quality is indicative of adequate mixing time, consistency, and relevant time limits.
  - d. Work shall be performed by a Special Inspector - Technical I. Report of results shall be made daily.
  - 6. Preparation and Placement: Inspect preparation and placement of concrete.
    - a. Verify acceptable general condition of concrete base prior to placement.
    - b. Verify that concrete conveyance and depositing avoids segregation and contamination.
    - c. Verify that concrete is properly consolidated.
    - d. Verify reinforcement remains at proper location.
  - 7. Protection and Curing: Observe protection and curing methods.
    - a. Verify specified curing procedures are followed.
    - b. Verify that specified hot and cold weather procedures are followed.
  - 8. Inspection Frequencies: Inspection frequencies shall be as shown in Table B at the end of this Section.
- M. Testing and inspection visits for the various required testing and inspection shall be combined and coordinated to the greatest extent practicable to minimize number of visits.

2.2 RETESTING AND RE-INSPECTION BY OWNER CTL:

- A. CTL will conduct retesting and re-inspection as necessary until corrections are fully completed by the Contractor.

<b>TABLE A - SECTION 03310 TESTING BY OWNER (CTL) SCHEDULE</b>		
Description of Testing-Work	Frequency	Section Reference Appendix B - 03310
Compressive strength for building foundations supporting CMU, concrete, and precast walls; and retaining walls including sampling, molding, and curing concrete specimens.	Appendix B – 03310 Section 1.1.I	2.1.I.1 2.1.J.3
Air content, temperature, slump, and unit weight for for building foundations supporting CMU, concrete, or precast walls; retaining wallsand exterior concrete paving areas		2.1.I.2

<b>TABLE B - SECTION 03310 INSPECTION BY OWNER (CTL) SCHEDULE</b>		
Description of Inspection Work	Frequency	Section Reference Appendix B - 03310
<b>All inspections below shall apply only to building foundations supporting CMU, precast, and concrete foundations; and to retaining walls</b>		
Concrete Form Work	One inspection at each formed concrete structural member prior to concrete placement.	2.1.L.1
Concrete Reinforcement.	One inspection at each concrete structural member prior to concrete placement.	2.1.L.2
Embedded Items	Periodic	2.1.L.3
Foundation Structural Inspection	One inspection at each concrete structural member prior to concrete placement.	2.1.L.4
Concrete Mix.	One inspection at each compressive cylinder test.	2.1.L.5

Preparation and Placement	Continuous throughout each concrete placement	2.1.L.6
Protection and Curing	One inspection per project	2.1.L.7

**SECTION 03314 - CAST-IN-PLACE CONCRETE SLABS (INTERIOR)**

2.1 OWNER TESTING AND INSPECTION (T&I)

- A. Owner T&I will be performed by the Owner’s Construction Testing Laboratory (CTL).
- B. Keep records of the testing and inspections.
- C. CTL is neither authorized to change any specified requirement nor to approve any portion of the work.
- D. Owner’s Concrete Consultant (SSI) is not authorized to change any specified requirement or to approve execution of any portion of the work.
- E. Failure to detect defective material or Work will neither prevent rejection when defects are discovered later nor will it obligate Owner to make final acceptance.
- F. Qualifications: Unless otherwise specified, work shall be performed by a Special Inspector - Technical II or Special Inspector - Structural I. In addition to the Inspector and CTL qualifications specified in this Appendix, the following qualifications shall apply for all Cast-in-Place Concrete inspection.
  - 1. Technical I: ACI Certified Grade I inspector.
  - 2. Technical II: ACI Certified Grade II inspector.
  - 3. CTL: C.C.R.L. certification at the National Bureau of Standards. (For multi-story projects only)
  - 4. Lead technician shall have at least five years’ experience in projects of this size and complexity.
  - 5. Other technicians shall have at least two years’ experience.
- G. Review the Contractor's proposed materials and mix design for conformance with specifications.
- H. Perform testing in accordance with testing standards listed herein.
- I. Field Testing:
  - 1. Slump, Air Content, and Concrete Materials Temperature Tests:
    - a. Test Methods:
      - 1) Slump - ASTM C 143.
      - 2) Concrete materials temperature - ASTM C 1064.
      - 3) Air content - ASTM C 173 or C 231.
      - 4) Unit weight - ASTM C138.
      - 5) Compressive Strength- ASTM C31, 39]
    - b. Periodic Test Frequencies:
      - 1) Conduct slump, air content, and temperature tests for the first placement of concrete and every 150 CY placed thereafter for each mix of concrete placed each day. If any test fails on the first placement, test at 50 CY for the corresponding failing test. If any test fails during normal 150 CY test intervals, test at next 50 CY for the corresponding failing test. Notify the Owner’s Construction Manager upon failure of any second failing test.
      - 2) Make cylinder sets for compressive strength testing once each day a given mix design is placed, and not less than once for each 150 cubic yards of each mix placed each day, nor less than once for each 5,000 square feet of each mix for slab surface area placed each day.]
      - 3) If pumping concrete is approved, take the same number of additional samples as noted herein for slump tests at point of delivery from pumping line.
  - 2. Flatness and Levelness Testing:
    - a. Test floor slab finished surface areas shown on drawings for flatness and levelness in accordance with ASTM E 1155, except as specified herein.
    - b. Perform testing at random on the first placement of the exposed sales floor slab and randomly on other placements as directed by the Owner’s Construction Manager or as directed by Owner.

- c. F-Number requirements shall be as follows for all interior sales floor slabs.
    - 1) FF /FL minimum overall for composite of measured values (SOV) for entire day's concrete placement; FF /FL minimum for any individual floor section (MLV) as specified in Tolerances paragraph.
  - d. 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.
  - e. Conform to F-numbers specified for floor areas within 2 feet of construction and isolation joints, in lieu of ASTM E 1155 requirements that exclude these areas.
  - f. Ensure top of entire floor falls within tolerances specified in Tolerances paragraph for finished floor elevation.
3. Complete testing, identify defective areas, and give verbal report to Owner's Construction Manager within 24 hours after placement.
  4. Submit written report by electronic means or hand deliver to parties concerned within 36 hours or next regularly scheduled working day (Mon-Sat), after placement. Include costs for retesting replaced or repaired defective areas.
  5. Note trends of decreasing quality in concrete due to changing seasons, conditions of curing, or other causes and bring to attention of the Owner's Construction Manager. Report and log comments on Non-Conformance Correction Log.
  6. Verify each delivery ticket of concrete. Report type of concrete delivered, amount of water added and time at which cement and aggregate were loaded into truck, and time at which concrete was discharged from truck.
  7. Verify that the proper amount of densifier has been applied to the concrete floor slab surface.
- J. Laboratory Testing Requirements:
1. Test items such as reinforcing steel, aggregates, and other products suspected of not meeting specified requirement as directed by Owner's Construction Manager to verify compliance. Provide test report to Owner's Construction Manager.
  2. In-place tests in accordance with ASTM C 42 shall be conducted as directed by the Owner's Construction Manager when specified concrete strengths and other characteristics have not been attained in the structures.
  3. Tests:
    - a. Secure composite samples in accordance with ASTM C 172. Sample at regularly spaced intervals from middle portion of the batch. Sampling time shall not exceed 15 minutes.
    - b. Mold and cure specimens in accordance with ASTM C 31.
      - 1) During the initial 24 hours (plus or minus 8 hours) after molding, the temperature immediately adjacent to the specimens shall be maintained in the range of 60 to 80 degrees F. Control loss of moisture from the specimens by shielding from the direct rays of the sun and from radiant heating devices.
      - 2) Specimens transported prior to 48 hours after molding shall not be demolded, but shall continue initial curing at 60 to 80 degrees F until time for transporting.
      - 3) Specimens transported after 48 hours age shall be demolded in 24 hours (plus or minus 8 hours). Curing shall then be continued but in saturated limewater at 73.4 degrees (plus or minus 3 degrees F) until the time of transporting.
      - 4) During transportation, protect the specimens with suitable cushioning material to prevent damage from jarring. During cold weather, protect specimens from freezing with suitable insulation material. Transportation time shall not exceed four hours.
      - 5) Date test cylinders and number consecutively. Give each cylinder of each set an identifying letter (i.e. A, B, C, D). Prepare a sketch of the building plan for each test set identifying location of placed concrete.
    - c. Test cylinders in accordance with ASTM C 39.
      - 1) Test one cylinder (A) at 7 days for information. If the compressive strength of the concrete sample is equal to or above the 28 day specified strength, test another cylinder (B) at 7 days. The average of the breaks shall constitute the compressive strength of the concrete sample.
      - 2) Test two cylinders (B and C) at 28 days and the average of the breaks shall constitute the compressive strength of the concrete sample.
      - 3) Retain fourth cylinder (D) for further testing if needed, but do not retain cylinder more than 60 days.
- K. Reporting:
1. Record the following information on concrete material reports and submit to Owner's Construction Manager and others as specified hereinbefore.

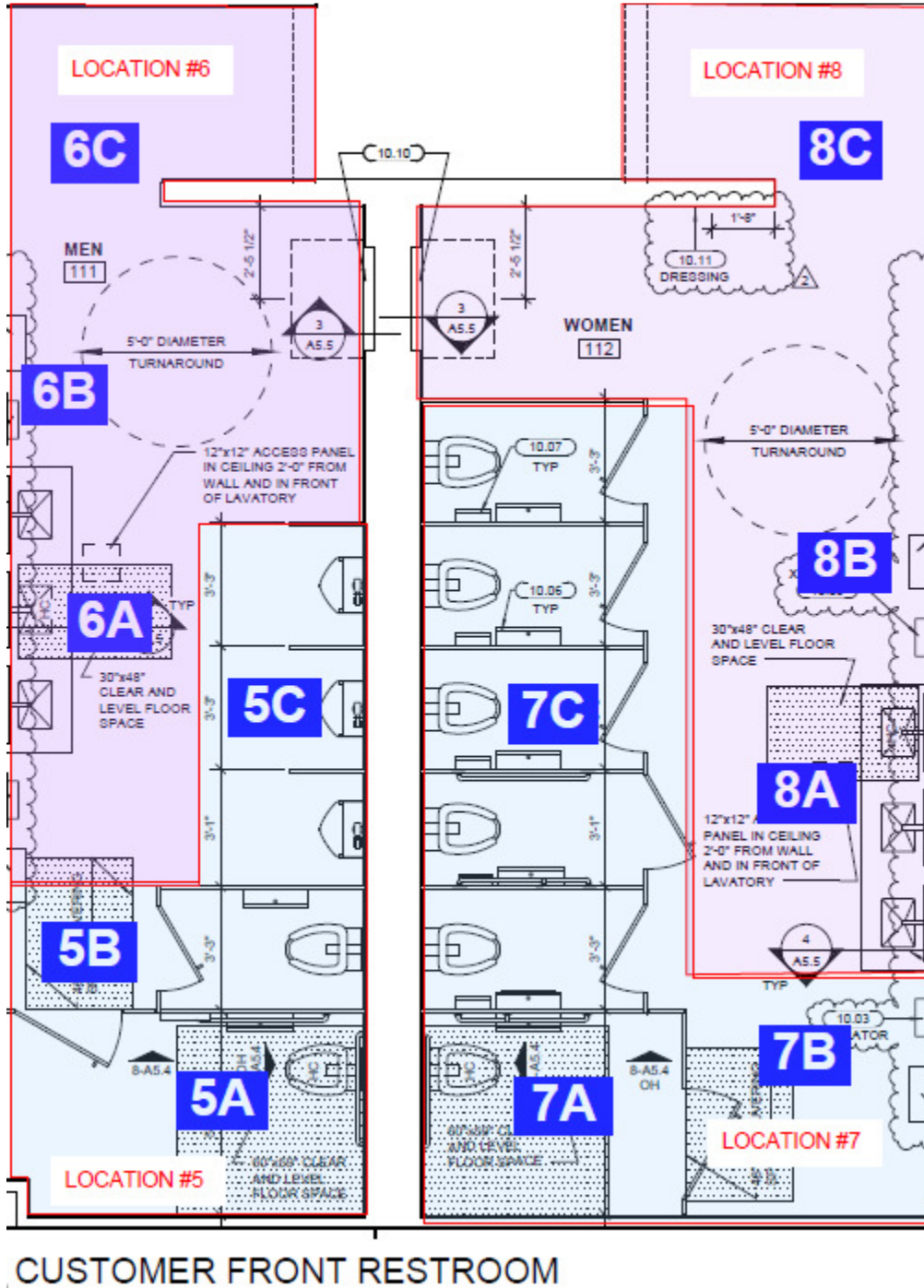
- a. Slump.
  - b. Air content.
  - c. Concrete temperature.
  - d. Concrete plastic unit weight.
  - e. Elapsed time from batching at plant to discharge from delivery truck at project.
  - f. Date and time concrete was placed.
  - g. Ambient temperature, wind speed, and relative humidity during concrete placement.
  - h. Name of technician performing tests.
  - i. Test cylinder number and letter.
  - j. Specific foundations or structures covered by this test.
  - k. Proportions of concrete mix or mix identification.
  - l. Maximum size coarse aggregate.
  - m. Specified compressive strength.
  - n. Tested compressive strength.
  - o. Curing conditions for concrete strength test specimens (field and laboratory).
  - p. Date strength specimens transported to laboratory.
  - q. Age of strength specimens when tested.
  - r. Type of fracture during test.]
2. Field Test Reports: Submit reports of field tests to Owner’s Construction Manager and others as specified hereinbefore. In addition to other required information noted in this Section, record the following concrete materials information on “Wal-Mart Interior Slabs on Ground Observation Report”:
- a. Date and time concrete was placed.
  - b. Time of batching at plant (As shown on delivery ticket)
  - c. Relative humidity, ambient temperature, and base temperature during concrete placement in accordance with ACI 305.1.
  - d. Time of placing and finishing tasks at location where sampled concrete is placed.
    - 1) Discharge from delivery.
    - 2) Start of initial floating.
    - 3) Start of initial troweling.
- L. Batch Plant Quality Control: Quality control of materials and batching operations during batching operations shall be the full responsibility of the batch plant operators. CTL or Owner’s Concrete Consultant will not be required to perform observation, testing, or inspection at the batch plant during batching operations.

**SECTION 03531 – ARCHITECTURAL CONCRETE OVERLAYMENT**

**2.1 OWNER TESTING AND INSPECTION (T&I):**

- A. Owner T&I will be performed by the Owner’s Independent Concrete Consultant (ICC).
- B. Floor Concrete Overlayment Test Frequency and Location:
  - 1. Test floor surface at locations as shown on the Restroom Floor Testing Locations Plan included below, in Customer Men’s and Customer Women’s restrooms in both front and rear of store.
- C. Include Measurement and Recording of the following:
  - 1. Dynamic Coefficient of Friction Testing:
    - a. Preparation: Begin DCOF testing only after cleaning floor surface with a non-etching cleaner to remove topical coatings and contaminants. Allow test surfaces to dry completely.
    - b. Test Method: Test DCOF on wet slab surface with 0.05% surfactant in accordance with the requirements of ANSI A 326.3 using BOT3000E equipment.
    - c. Frequency: Take one reading at each test location shown on the Testing Locations Plan.
  - 2. Slab Aesthetics Testing: Record measurements of Distinction of Image (DOI), Gloss, and Haze factors.
    - a. Test Methods:
      - 1) Test DOI in accordance with the requirements of ASTM D 5767 and Haze in accordance with the requirements ASTM D 1003 using Rhopoint IQ GM14400 instrumentation.
      - 2) Measure and certify Gloss using Rhopoint IQ GM14400 instrumentation.
    - b. Measure DOI, Gloss, and Haze in locations adjacent to the location of the DCOF measurement.
    - c. Frequency: Take one DOI, Gloss, and Haze reading at each test location shown on the Testing Locations Plan.

3. Surface Roughness Testing:
  - a. Test Method: Measure surface roughness (Ra) using MarSurf PS 10 profilometer by Mahr Federal.
  - b. Frequency: Take one Roughness reading at each test location shown on the Testing Locations Plan.
- D. Record measurement locations on a copy of the Restroom Floor Testing Locations Plan.
- E. Provide Condition Report, including general floor conditions, test measurements, any installation deficiencies, and recommendations for remediation.
- F. Restroom Floor Testing Locations Plan: The highlighted areas in the Testing Locations Plan below indicate floor testing locations in Customer Men's and Women's Restrooms.



## SECTION 04200 - UNIT MASONRY ASSEMBLIES

### 2.1 OWNER TESTING AND INSPECTION (T&I)

- A. Owner T&I will be performed by the Owner's Construction Testing Laboratory (CTL).
- B. Perform Tests and Inspections as specified herein and as indicated in Table A - Testing and Inspection Schedule at the end of this Section.
- C. Work shall be performed by a Special Inspector - Technical II or Special Inspector - Structural I
- D. Field Testing: Field testing, frequency, and methods may vary as determined by and between Owner and Owner's Construction Testing Laboratory.
  - 1. Masonry Units:
    - a. Compressive Strength of Masonry ( $f'_m$ ): Verify compressive strength of masonry by the unit strength method. Results of net-area unit strength tests shall meet the requirement of MSJC based on the specified mortar type and the design  $f'_m$  listed on the structural drawings
    - b. Three units for each type will be obtained and tested for every 5,000 square feet of wall constructed or fraction thereof.
    - c. The net area compressive strength of the masonry units shall be determined in accordance with ASTM C 140. The average of 3 units is considered one test.
    - d. Strength of concrete masonry units will be considered satisfactory if each compressive strength test passes.
  - 7. Grout:
    - a. Verify that the delivered grout mix complies with the submitted mix design.
    - b. Sample, cure, and test grout samples in accordance with ASTM C 1019.
      - 1) Cast 4 grout specimen for each 5,000 square feet of wall placed each day or fraction thereof.
      - 1) Test 2 of the specimen at 7 days in accordance with ASTM C 39.
      - 2) Test 2 of the specimens at 28 days in accordance with ASTM C 39.
- E. Inspections:
  - 1. General: Inspect masonry work for compliance with Construction Documents. Inspection of masonry shall be performed during placing of masonry units, placement of structural reinforcement, cleanout of grout space immediately prior to closing of elements, and during all grouting operations.
  - 2. Frequency of Inspection:
    - a. "Continuous" Inspection of Masonry:
      - 1) Grouting: 100% of structural grouting operations.
    - b. "Periodic" Inspection of masonry:
      - 1) Placing of Units: Not less than once/week nor less than once for every 2,000SF of surface or fraction thereof.
      - 2) Reinforcement: Verification of compliance of grout spaces and of grades, sizes, and locations of reinforcement.
  - 3. Preparation and Placement
    - a. Base Conditions: Verify that masonry bearing surfaces are clean.
    - b. Condition of Units: Verify that masonry units are clean and sound and dry.
    - c. Mortar: Verify mortar is prepared in accordance with specification requirements.
    - d. Placement: Inspect laying of masonry units for nominal unit widths, stack or running bond, proper thickness and tooling of mortar joints, and depth of furrowing of bed joints. Note temperature at time of inspection.
    - e. Joints: Inspect construction, expansion, and contraction joints for location and continuity of steel.
    - f. Verify hot and cold weather procedures are followed.
    - g. Verify wall cavities are protected against entry of precipitation.
  - 4. Bond Beams: Inspect and report on the following:
    - a. Location.
    - b. Size, placement, and lap of reinforcing bars.
    - c. Placement and vibration of grout.
  - 5. Openings: Inspect and report on the following:
    - a. Types of concrete masonry units used to form lintels.
    - b. Reinforcing bar size and placement at lintel.

- c. Stirrup size and spacing at lintel.
  - d. Vertical reinforcing size and placement at door jambs.
  - e. Placement and vibration of grout in lintels and jambs.
  - 6. Pilasters: Inspect and report on the following:
    - a. Vertical reinforcing size and placement.
    - b. Tie size and placement.
    - c. Placement and vibration of grout.
  - 7. Masonry Reinforcement:
    - a. Vertical Reinforcement: Inspect placement and alignment of vertical bars and dowels for size, grade and spacing. Inspect length of lap splices, clearances between bars, clearances to masonry units and outside face of walls, and positioning of steel.
    - b. Horizontal Reinforcement: Inspect horizontal joint reinforcement steel and masonry reinforcement bars for size, length of lap splices, dowels, clearances between bars, clearance to masonry units and outside face of walls, and alignment.
    - c. Ties: Inspect ties in masonry for type, straightness, embedment, spacing and size.
    - d. Dowels and Anchors: Inspect the installation of masonry anchor bolts, joist anchors, inserts, straps, and dowels. Inspect spacing and grouting of embedded plates for joist bearing. Inspect spacing and grouting of embedded plates for continuous angle attachment at roof perimeter.
  - 8. Prior to Masonry Grouting and Capping:
    - a. Grout Spaces: Verify that grout spaces are correctly sized and clean, cleanouts are closed after inspection and grout barriers are in place before grouting.
    - b. Dry Packing: Verify proper application of dry packing.
    - c. Grouting: Verify proper grouting technique including consolidation to approved height of grout space, reconsolidation and vibration.
- F. Mortar and Grout Mix Verification: Verify mixes conform to the submittal requirements specified.
- G. Reports:
1. Masonry: In addition to required information noted previously in this Section, record the following information on concrete masonry unit test reports:
    - a. Test sample number.
    - b. Specific wall areas represented by test sample.
    - c. Description of units used to form sample.
    - d. Tested net area compressive strength to the nearest 10 psi separately for each specimen and as the average of three specimens.
  2. Masonry Grout: In addition to required information in Specifications Section 01457, submit reports in accordance with ASTM C 1019 for grout mixes showing compliance with specified compressive strength and material requirements.
  3. Mix Design: Record verification of conformance of mortar and grout mixes to mix design.

2.2 RETESTING AND RE-INSPECTION BY OWNER CTL

- A. CTL will conduct retesting and re-inspection as necessary until corrections are fully completed by the Contractor.

<b>TABLE A - SECTION 04200 OWNER TESTING AND INSPECTION SCHEDULE</b>		
<b>Description of Verification and Inspection Work</b>	<b>Inspection Frequency</b>	<b>Referenced Standards</b>
<b>Level 1 Special Inspection</b> As masonry construction begins, the following shall be verified to ensure compliance: <ol style="list-style-type: none"> <li>1. Construction of mortar joints.</li> <li>2. Location of reinforcement, connectors, and embedded anchorages.</li> </ol>	Periodic	TMS 602/ACI 530.1/ASCE 6 Art. 2.6A TMS 602/ACI 530.1/ASCE 6 Art. 3.3B TMS 602/ACI 530.1/ASCE 6 Art. 3.4 & 3.6A

<p>The inspection program shall verify:</p> <ol style="list-style-type: none"> <li>1. Size and location of structural elements.</li> <li>2. Type, size, and location of anchors, including other details of anchorage to masonry to structural members, frame or other construction.</li> <li>3. Specified size, grade, and type of reinforcement.</li> <li>4. Protection of masonry during cold weather (temperature below 40°F) or hot weather (temperature above 90°F).</li> </ol>	Periodic	<p>TMS 602/ACI 530.1/ASCE 6 Art. 3.3G  TMS 402/ACI 530/ASCE 5 Sec. 1.2.2(e), 2.1.4, 3.1.6  TMS 402/ACI 530/ASCE 5 Sec. 1.13  TMS 602/ACI 530.1/ASCE 6 Art. 2.4 &amp; 3.4  TMS 602/ACI 530.1/ASCE 6 Art. 1.8C &amp; 1.8D</p>
<p>Prior to grouting, the following shall be verified to ensure compliance:</p> <ol style="list-style-type: none"> <li>1. Grout space is clean.</li> <li>2. Placement of reinforcement, connectors, and embedded anchorages.</li> <li>3. Proportions of site-prepared grout.</li> <li>4. Construction of mortar joints.</li> </ol>	Periodic	<p>TMS 602/ACI 530.1/ASCE 6 Art. 3.2D  TMS 402/ACI 530/ASCE 5 Sec. 1.13  TMS 602/ACI 530.1/ASCE 6 Art. 3.4  TMS 602/ACI 530.1/ASCE 6 Art. 2.6B  TMS 602/ACI 530.1/ASCE 6 Art. 3.3B</p>
<p>Grout placement shall be verified to ensure compliance with code and construction document provisions.</p>	Continuous	<p>TMS 602/ACI 530.1/ASCE 6 Art. 3.5</p>
<p>Preparation of any required grout specimens and/or prisms shall be observed.</p>	Continuous	<p>TMS 602/ACI 530.1/ASCE 6 Art. 1.4</p>
<p>Compliance with required inspection provisions of the construction documents and the approved submittals shall be verified.</p>	Periodic	<p>TMS 602/ACI 530.1/ASCE 6 Art. 1.5</p>

## SECTION 05090 - CONCRETE AND MASONRY ANCHORS

### 2.1 OWNER TESTING AND INSPECTION (T&I):

- A. Owner T&I will be performed by the Owner's Construction Testing Laboratory (CTL).
- B. Owner T&I shall be performed by a Special Inspector - Technical II or Special Inspector - Structural I.
- C. Section Includes:
  1. Mechanical and adhesive anchors for structural members, equipment supports.
  2. Mechanical and adhesive anchors for signage.
  3. Mechanical type anchors for sales floor shelving fixtures and storage racks.
  4. Mechanical type anchors for garden center storage racks.
  5. Mechanical type anchors for prefabricated wall panel assembly.
- D. Periodically verify and inspect the following for each anchor specified in Section 05090:
  1. General compliance with manufacturer's published instructions.
  2. Product name and description.
  3. Adhesive expiration date for adhesive anchors.
  4. Compliance of drill bit with manufacturer's specifications.
  5. Adhesive application technique for adhesive anchors.
  6. Concrete type, compressive strength, and member thickness.
  7. Hole diameter, depth, location, and edge distance.
  8. Cleanliness of hole and anchor.
  9. Anchor diameter, length, and steel grade.
  10. Anchor embedment and spacing.
  11. Required tightening torque for mechanical anchors.



- E. Testing: Perform pullout or shear tests to determine adequacy of suspected malfunctioning anchors when directed to do so by the Owner's Construction Manager upon recommendation by the CTL.

## **SECTION 05120 - STRUCTURAL STEEL**

### **2.1 OWNER TESTING AND INSPECTION (T&I):**

- A. Owner T&I will be performed by the Owner's Construction Testing Laboratory (CTL).
- B. Owner T&I shall be performed by a Special Inspector - Technical II or Special Inspector - Structural I.
- C. In addition to the Special Inspector qualification stated in this Section, the Technical II Inspector shall be an American Society for Non-destructive Testing (ASNT) Non-destructive Testing Technician, TC-1A Level I, or an American Welding Society (AWS) Certified Associate Weld Inspector (C.A.W.I.)
- D. CTL shall report results after each observation visit.
- E. High Strength Bolting (Field Installed):
  - 1. General:
    - a. Visually inspect mating surfaces and bolt type for all slip-critical bolted connections prior to bolting.
    - b. Verify that bolts, nuts, washers, paint and installation/tightening standards are met.
    - c. Observe calibration procedures and verify that selected procedure is used to tighten bolts.
    - d. Test high strength bolted connections in accordance with bolting standard specified above.
  - 2. Slip Critical and Tension Bolts: Test bolt tightening in 100% of bolts. Verify that surfaces of connected elements have been brought into contact at 100% of connections. Verify all tips are removed from twist-off bolts.
  - 3. Bearing Bolts: Visually inspect to confirm surfaces of connected elements have been brought into contact, at 100% of connections. This shall apply only to bolts designed for values not requiring exclusion of threads from failure plane. All other bolts shall be tested as for tension bolts.
- F. High Strength Bolting (Shop Installed): Self performed by the Fabricator as part of their compliance with AISC Quality Certification Program - Category I requirements. For shop fabricated work, perform tests if more stringent requirements are required by either the AHJ or the SER. Shop bolting inspection requirements are same as field bolting requirements.
- G. Welding (General):
  - 1. Prior to start of fabrication, determine if fabrication shop meets the criteria for exempting shop welds from inspection and confirm in writing to Building Official and SER.
  - 2. Verify qualifications of welders as AWS certified.
  - 3. Verify proposed welding procedures and materials.
  - 4. Verify adequate preparation of faying surfaces.
  - 5. Verify preheat and interpass temperatures of steel, proper technique and sequence of welding, and cleaning and number of passes are provided as required.
- H. Welding (Field):
  - 1. Visible and uncovered at the time of each inspection for proper inspection procedures.
  - 2. Single Pass Fillet Welds: Visually inspect 100% of single pass fillet welds for size, length, and quality, per AWS D1.1.
  - 3. Multi-pass Fillet Welds: Visually inspect 100% of multi-pass fillet welds for size, length, and quality, per AWS D1.1.
  - 4. Partial Penetration Welds: Test 100% of partial penetration welds exceeding 5/16 inch, using Ultrasonic Testing per AWS. D1.1. Test 100% of partial penetration welds less than 5/16 inch, using Magnetic Particle Testing per ASTM E 709, performed on root pass and on finished weld.
  - 5. Complete Penetration Welds: Test 100% of complete penetration welds exceeding 5/16 inch, using Ultrasonic Testing per A.W.S. D1.1 Test 100% of complete penetration welds less than 5/16 inch, using Magnetic Particle Testing per ASTM E 709, performed on root pass and on finished weld.
  - 6. Miscellaneous Metals, Inserts and Prefabricated Components: Where integrity of the connections impact life safety or performance of the building structure, provide testing and inspection as for typical welds previously specified.

- I. Coordinate and schedule inspections such that completed bolts and welds are visible and uncovered at the time of each inspection for proper inspection procedures.
- J. Welding (Shop): Perform inspections as for field welding except weld testing may be reduced or deleted if fabrication shop satisfies AISC Quality Certification Program - Category I, or more stringent criteria, and is approved by Building Official and SER.
- K. Submittal Verification: Verify mill test reports and other submitted documentation for compliance with Contract Documents.
- L. Materials Verification: Verify materials delivered to Site comply with Contract Documents and approved shop drawings. Materials and verifications include:
  - 1. Structural Steel:
    - a. Identification markings to conform to ASTM standards.
    - b. Manufacturer's certified mill test reports.
  - 2. High Strength Bolts, Nuts, and Washers:
    - a. Identification markings to conform to ASTM standards.
    - b. Manufacturer's certificate of compliance.
  - 3. Welding Electrodes:
    - a. Identification markings to conform to AWS specification.
    - b. Manufacturer's certificate of compliance.
- M. Verification of Detail Compatibility.
  - 1. Inspection shall coincide with welding inspections.
  - 2. Review project documents affecting integrity of the structure, including Contract Documents and pertinent submittals including approved shop drawings.
  - 3. Perform review of the structure and visually confirm general compliance with Contract Documents.
  - 4. Inspect the following to verify member orientation, configuration, type, and size comply with details indicated in Contract Documents and approved shop drawings:
    - a. Bracing and stiffening members.
    - b. Structural member locations.
    - c. Proper applications of joint details at connections for structural members.

## 2.2 RETESTING AND RE-INSPECTION BY OWNER CTL:

- A. CTL will conduct retesting and re-inspection as necessary until corrections are fully completed by the Contractor. Retesting shall follow the procedures for correction of deficiencies described above.

## SECTION 05210 - STEEL JOISTS

### 2.1 OWNER TESTING AND INSPECTION (T&I):

- A. Owner T&I will be performed by the Owner's Construction Testing Laboratory (CTL).
- B. Owner T&I shall be performed by a Special Inspector - Technical II or Special Inspector - Structural I.
- C. High Strength Bolting (Field Installed):
  - 1. General:
    - a. Visually inspect mating surfaces and bolt type for all slip-critical bolted connections prior to bolting.
    - b. Verify that bolts, nuts, washers, paint and installation/tightening standards are met.
    - c. Observe calibration procedures used to tighten bolts.
    - d. Test high strength bolted connections in accordance with RCSC Specification for Structural Joints Using ASTM A 325 or A 490 Bolts.
  - 2. Slip Critical Bolts and Tension Bolts:
    - a. Test bolt tightening in 100% of bolts. Verify that surfaces of connected elements have been brought into contact at 100% of connections. Verify tips are removed from "twist-off" bolts.
  - 3. Bearing Bolts:

- a. Visually inspect to confirm surfaces of connected elements have been brought into contact at 100% of connections. This shall apply only to bolts designed for values not requiring exclusion of threads from failure plane. All other bolts shall be tested as for tension bolts.

D. Welding (General):

1. Verify qualifications of all welders as AWS certified.
2. Verify proposed welding procedures and materials.
3. Verify adequate preparation of faying surfaces.
4. Verify preheat and interpass temperatures of steel, proper technique and sequence of welding, and cleaning and number of passes are provided as required.

E. Welding (Field):

1. Single Pass Fillet Welds: Visually inspect 100% of single pass fillet welds, for size, length, and quality, per AWS D1.1.
2. Multi-pass Fillet Welds: Continuously inspect 100% of multi-pass fillet welds, for size, length, and quality, per AWS D1.1
3. Partial Penetration Welds: Test 100% of partial penetration welds exceeding 5/16 inch, using Ultrasonic Testing per AWS. D1.1. Test 100% of partial penetration welds less than 5/16 inch, using Magnetic Particle Testing per ASTM E 709, performed on root pass and on finished weld.
4. Complete Penetration Welds: Test 100% of complete penetration welds exceeding 5/16 inch, using Ultrasonic Testing per A.W.S. D1.1 Test 100% of complete penetration welds less than 5/16 inch, using Magnetic Particle Testing per ASTM E 709, performed on root pass and on finished weld.
5. Steel Joist/Joist Girder Welds: Provide testing and inspection as specified for field welds.
6. Miscellaneous Metals, Inserts and Prefabricated Components: Where integrity of the connections impact life safety or performance of the building structure, provide testing and inspection as for typical welds previously specified.

- F. Coordinate and schedule inspections such that completed welds and bolts are visible and uncovered at the time of each inspection for proper inspection procedures.

- G. Submittal Verification: Verify mill test reports and other submitted documentation, for compliance with contract document.

- H. Material Verification: Verify materials delivered to site comply with contract documents and approved shop drawings. Verify the following:

1. Structural Steel Bar Joists and Joist Girders.
2. High Strength Bolts, Nuts, and Washers:
  - a. Identification markings conform to ASTM standards.
  - b. Manufacturer's certificate of compliance.
3. Welding Electrodes
  - a. Identification markings conform to AWS specification.
  - b. Manufacturer's certificate of compliance.

- I. Verification of Detail Compatibility.

1. Inspection shall coincide with welding inspections.
2. Review project documents affecting integrity of the structure, including Contract Documents and pertinent submittals including approved shop drawings.
3. Perform review of the structure and visually confirm general compliance with Contract Documents.
4. Inspect the following to verify member orientation, configuration, type, and size comply with details indicated in Contract Documents and approved shop drawings:
  - a. Bracing and stiffening members.
  - b. Structural member locations.
  - c. Proper applications of joint details at connections for structural members.

## 2.2 RETESTING AND RE-INSPECTION BY OWNER CTL

- A. CTL will conduct retesting and re-inspection as necessary until corrections are fully completed by the Contractor.

## SECTION 05300 - METAL DECK

2.1 OWNER TESTING AND INSPECTION (T&I):

- A. Owner T&I will be performed by the Owner's Construction Testing Laboratory (CTL).
- B. If inspection of fabricator's work is required, testing agent may test and inspect structural steel at plant before shipment. Owner and SER reserve right to reject material not complying with Contract Documents at any time before final acceptance.
- C. Owner T&I shall be performed by a Special Inspector - Technical II or Special Inspector - Structural I.
- D. CTL will prepare report of results after each observation visit and submit report to Owner.
- E. Roof Deck Fasteners:
  - 1. Visually inspect welded and screw fasteners for specified size, spacing, embedment, and location.
  - 2. Inspect 100% of side lap connectors over entire roof area for type, size, and spacing of side lap connectors. Verify that the side lap connection connects all layers of the deck tightly.
  - 3. Inspect 100% of primary deck attachments to continuous steel members (joists, joist girders, and perimeter angles).
  - 4. For TEK screw connections, inspect for complete depth of penetration.
  - 5. For welded connections inspect for fusion and size.
- F. Coordinate and schedule inspections such that completed welds and fasteners are visible and uncovered at the time of each inspection for proper inspection procedures.
- G. Submittal Verification: Verify mill test reports and other submitted documentation, for compliance with Contract Documents.
- H. Materials Verification:
  - 1. Verify materials delivered to Site comply with Contract Documents and approved shop drawings. Materials include:
    - a. Welding Electrodes:
    - b. Identification markings to conform to AWS specification.
    - c. Manufacturer's certificate of compliance.
    - d. Mechanical fasteners.
    - e. Deck: Select 6 random sheets for each type of deck used. Inspect for deck thickness, type, and material.

2.2 RETESTING AND RE-INSPECTION BY OWNER CTL:

- A. CTL will conduct retesting and re-inspection as necessary until corrections are fully completed by the Contractor.

**SECTION 05400 - COLD FORMED METAL FRAMING**

2.1 OWNER TESTING AND INSPECTION (T&I):

- A. Owner T&I will be performed by the Owner's Construction Testing Laboratory (CTL).
- B. Owner T&I shall be performed by a Special Inspector - Technical II or Special Inspector - Structural I.
- C. Welding (General):
  - 1. Verify qualifications of all welders as AWS certified.
  - 2. Verify proposed welding procedures and materials.
  - 3. Verify adequate preparation of faying surfaces.
  - 4. Verify preheat and interpass temperatures of steel, proper technique and sequence of welding, and cleaning and number of passes are provided as required.
- D. Welding (Field):

1. Cold Formed Metal Framing Welds: Visually inspect 100% of welds for specified length, size, and continuity in accordance with AWS D1.3 for metal less than 1/8" in thickness, for work designed as a structural element.
  2. Miscellaneous Metals, Inserts and Prefabricated Components: Where integrity of the connections impact life safety or performance of the building structure, provide testing and inspection as for typical welds previously specified.
- E. Welding (Shop): Perform inspections as for field welding except weld testing may be reduced or deleted if fabrication shop satisfies AISC Quality Certification Program - Category I, or more stringent criteria, and is approved by building official and SER.
- F. Miscellaneous Mechanical Fasteners: Visually inspect fasteners that are part of the building structural system for specified size, spacing, and location.
- G. Submittal Verification: Verify mill test reports and other submitted documentation for compliance with contract documents.
- H. Material Verification: Verify materials delivered to site comply with contract documents and approved shop drawings. Materials include:
1. Welding Electrodes
    - a. Identification markings to conform to AWS specifications.
    - b. Manufacturer's certificate of compliance.
  2. Mechanical fasteners
- I. Coordinate and schedule inspections such that completed welds and fasteners are visible and uncovered at the time of each inspection for proper inspection procedures.
- 2.2 RETESTING AND RE-INSPECTION BY OWNER CTL:
- A. CTL will conduct retesting and re-inspection as necessary until corrections are fully completed by the Contractor.

#### **SECTION 07243 - WATER-DRAINAGE EXTERIOR INSULATION AND FINISH SYSTEM (EIFS)**

- 2.1 OWNER TESTING AND INSPECTION (T&I):
- A. Owner T&I will be performed by the Owner's Construction Testing Laboratory (CTL).
- B. Special Inspections: CTL shall perform special inspections of water-resistive barrier for EIFS and prepare reports according to ICC-ES AC 212 and AC235.
1. Perform one time inspection of water-resistive barrier installation to verify compliance with the Acceptance Criteria (AC) as specified above.

#### **SECTION 07530 - ELASTOMERIC MEMBRANE ROOFING**

- 2.2 OWNER TESTING AND INSPECTION
- A. Roof Observation Program: The CTL will develop a comprehensive Roof Observation Program to be administered by the IRI. The Program is described in the "Roof Observation Program paragraph herein above.
- B. Roof Inspection:
1. The Owner's Independent Roofing Inspector (IRI) will conduct roof inspections as specified herein. The IRI responsibilities will, in general, be as follows:
    - a. Provide full time inspection during roof installation.
    - b. Complete Roof Inspection Checklist.
    - c. Oversee remedial repairs in the field.
    - d. Enter roofing defects and required repairs defined as deviations by the IRC into the online Owner's Observation Log.
    - e. Issue Certification of Quality of Roof Construction upon completion of roof installation.

- C. The activities and responsibilities of the IRI shall not preclude any quality control responsibilities by the Contractor, the Roofing Contractor, or the Manufacturer's Technical Representative as specified herein.
- D. The IRI is neither authorized to change any specified requirement nor to approve any portion of the work.
- E. Failure to detect defective material or Work will neither prevent rejection when defects are discovered later nor will it obligate Owner to make final acceptance.

**SECTION 07550 - MODIFIED BITUMINOUS MEMBRANE ROOFING**

2.1 OWNER TESTING AND INSPECTION

- A. Roof Observation Program: The CTL will develop a comprehensive Roof Observation Program to be administered by the IRI. The Program is described in the "Roof Observation Program paragraph herein above.
- B. Roof Inspection:
  - 1. The Owner's Independent Roofing Inspector (IRI) will conduct roof inspections as specified herein. The IRI responsibilities will, in general, be as follows:
    - a. Provide full time inspection during roof installation.
    - b. Complete Roof Inspection Checklist.
    - c. Oversee remedial repairs in the field.
    - d. Enter roofing defects and required repairs defined as deviations by the IRC into the online Owner's Observation Log.
    - e. Issue Certification of Quality of Roof Construction upon completion of roof installation.
- C. The activities and responsibilities of the IRI shall not preclude any quality control responsibilities by the Contractor, the Roofing Contractor, or the Manufacturer's Technical Representative as specified herein.
- D. The IRI is neither authorized to change any specified requirement nor to approve any portion of the work.
- E. Failure to detect defective material or Work will neither prevent rejection when defects are discovered later nor will it obligate Owner to make final acceptance.

**SECTION 09511 - ACOUSTICAL PANEL CEILINGS**

2.1 OWNER TESTING AND INSPECTION (T&I):

- A. CTL shall perform periodic special inspection during installation of acoustical panel ceilings, including acoustical panel placement, ceiling grid suspension system installation and connection to structure.

**SECTION 11400 - FOOD SERVICE EQUIPMENT**

2.1 OWNER TESTING AND INSPECTION (T&I):

- A. Owner T&I specified herein below will be performed by the Owner's Food Service Equipment Supplier or Owner Furnished Equipment Manufacturer's Representative who will also conduct operational tests on Owner Furnished Equipment at no cost to Contractor, except for items specifically indicated to be tested by Contractor.
- B. Owner will perform operational tests of equipment through full operational cycle and operate for a sufficient time to verify that equipment is operating within manufacturer's specifications.
- C. Operational tests will be completed no later than one week after Date of Possession.
- D. Contractor's Responsibility: Provide adjustments or changes as required from operation test results.

**SECTION 13810 – BUILDING AUTOMATION SYSTEMS**

2.2 OWNER TESTING AND INSPECTION (T&I):

- A. The Owner will perform testing and inspection (T&I) but only as a means to satisfy the Owner of contract compliance and as assurance to the Owner of Contractor quality control performance.
- B. Functional Performance Testing (FPT): FPT will be performed after Owner's possession date. Deficiencies noted and related to the Contractor's installation responsibilities shall be corrected prior to Grand Opening.
  - 1. FPT will be performed by Owner's Engineer of Record at no cost to the Contractor in accordance with Section 01454
  - 2. Contractor shall provide a technician dedicated to assisting the Engineer of Record the day of the FPT.

**SECTION 13900 – FIRE SUPPRESSION**

2.1 OWNER SITE OBSERVATION:

- A. Fire Sprinkler System Construction Follow Up: Owner's Fire Protection Consultant (as specified in Section 01330) will conduct a Pre Construction Conference Call and Fire Sprinkler Site Observation and Acceptance Test (FPAT). The purpose of the Pre Construction Conference call is to review status of project, notify contractor of status of approvals, and review project expectations. The purpose of the Fire Sprinkler System Site Observation is to validate that new or remodeled fire sprinkler systems are in general conformance with Contract Documents and shop drawings. The Contractor shall coordinate with Wal-Mart's Fire Protection Consultant for the time and date of the test. Scheduling for the FPAT shall begin 21 days prior to Construction End Date with FPAT being conducted one to one week prior to Construction End Date. FPAT shall occur prior to Construction End Date. A representative sample checklist is available upon request.
  - 1. FPAT: Owner's Fire Protection Consultant will meet the Contractor and Sprinkler Contractor. Contractor shall invite Alarm Central representatives to the test, but their presence is not required. At scheduled time, Contractor/Sprinkler Contractor shall be ready to initiate Acceptance tests as outlined herein. Prior to initiating tests, the following information shall be reviewed and copies provided to Wal-Mart's Fire Protection Consultant.

**SECTION 14420 – WHEELCHAIR LIFTS**

2.1 OWNER TESTING AND INSPECTION (T&I):

- A. Owner's Vertical Transportation Consultant (VTC) Services: The VTC will perform testing and commissioning at no cost to the Contractor.
- B. Owner's VTC:
  - 1. [Lerch Bates Elevator Consulting](http://www.lerchbates.com), Carrollton, TX. Contact: Jacob Erwin, (214) 908-9368, [jacob.erwin@lerchbates.com](mailto:jacob.erwin@lerchbates.com).
- C. VTC will attend and facilitate a Pre-Installation Conference as defined in Part 1 of Specifications Section 14420.
- D. The activities and responsibilities of the VTC shall not preclude any quality control responsibilities by the Contractor, the Lift Installation Contractor, or the Manufacturer's Technical Representative as specified in Specifications Section 14420.
- E. The VTC is neither authorized to change any specified requirement nor to approve any portion of the work.
- F. Failure to detect defective material or Work will neither prevent rejection when defects are discovered later nor will it obligate Owner to make final acceptance.

[with Auto-FPT function](#) **SECTION 15600 – REFRIGERATION SYSTEM**

2.1 OWNER TESTING AND INSPECTION (T&I):

- A. The Owner will perform testing and inspection (T&I) but only as a means to satisfy the Owner of contract compliance and as assurance to the Owner of Contractor quality control performance.

- B. Functional Performance Testing (FPT): FPT will be conducted by Engineer of Record at no cost to the Contractor in accordance with Section 01454; however, Contractor shall furnish a technician dedicated to assisting the Engineer of Record the day of the FPT. FPT will be performed after Owner’s possession date. Deficiencies noted and related to the Contractor’s installation responsibilities shall be corrected prior to Grand Opening.
- C. Direct Expansion Refrigeration FPT (RFPT) Scope of Work:
1. Test compressor staging and unloaders via overrides of primary suction pressure. Test suction float via overrides of float circuits’ temperatures.
  2. Test condenser VFD and split operation via overrides of VFD comparator values.
  3. Test subcooler operation of LLSVs and LPR Bypass Solenoids via overrides of subcooled liquid temperatures.
  4. Test surge receiver bypass solenoid operation via overrides of drop leg temperatures.
  5. Generate rack alarms including low suction pressure, high suction pressure and high head pressure via overrides of appropriate pressure transducers.
  6. Review rack history logs for evidence of flood back after defrost by looking for downward drops in suction gas temperatures at the rack.
  7. Review rack history logs for evidence of flood back during refrigeration mode by looking for upward spikes in suction gas temperatures at the rack when the flooding circuit is in defrost.
  8. Record system control settings as they exist at the time of testing and compare to design documents.
- D. In-Office Remote Performance Verification:
1. Review rack history logs for evidence of flood back, CO2 vessel pressure vs. design operating pressures, glycol supply temperatures per chiller vs. design temperatures.
  2. Review case / walk-in history logs for temperature performance including temperature balance across lineups and operating temperatures vs. design temperatures.
  3. Review case / walk-in history logs for adequate defrost performance including design defrost termination temperatures vs. actual temperatures at the ends of defrost cycles.
  4. Record case / walk-in control settings and compare to design documents
- E. Air-Cooled Secondary Coolant Refrigeration FPT (RFPT) Scope of Work:
1. After commissioning but prior to GO, the REOR shall send a qualified representative to the jobsite to test the refrigeration components and sequences listed in the following narratives. The REOR shall be familiar with the refrigeration BAS and shall not require assistance from Walmart Digital Asset Team to conduct the testing other than to enter and clear system “FYIs” for alarm generation. The REORs shall use checklists furnished by Walmart for testing, with site adaptations as necessary for the equipment being tested.
  2. Test compressor staging and unloaders via overrides of primary suction pressure. Test suction float via overrides of secondary glycol supply temperatures and CO2 master / vessel pressures.
  3. Test condenser VFD and split operation via overrides of VFD comparator values.
  4. Test subcooler operation via override of subcooled liquid temperatures.
  5. Test surge receiver bypass solenoid operation via overrides of drop leg temperatures.
  6. Generate primary rack alarms including low suction pressure, high suction pressure and high head pressure via overrides of appropriate pressure transducers.
  7. Test CO2 primary and backup pump operation via toggle switches and overrides of supply pressure transducers. Generate CO2 pump alarms including low differential pressure and pump failure via overrides of master / vessel pressure overrides. Generate CO2 vessel pressure alarms including low pressure pump shut down, high pressure pump shut down and high pressure defrost panel shut down. Stage CO2 heat exchangers and master LLSV on/off via overrides of master / vessel pressure. Generate CO2 vessel level alarms including low level warning, low level pump shut down and high level alarm via relay overrides.
  8. Test medium temperature glycol pump lead/lag operation via overrides of glycol supply pressure. Generate glycol pump station alarms including pump failure, low suction pressure and low differential pressure via overrides of glycol return pressure. Stage glycol heat exchangers on/off via override of glycol supply temperatures.
  9. Record system control settings as they exist at the time of testing and compare to design documents.

## **SECTION 15700 – HEATING, VENTILATING, AND AIR CONDITIONING EQUIPMENT**

### **2.1 OWNER TESTING AND INSPECTION (T&I)**



- A. The Owner will perform testing and inspection (T & I) in the following systems but only as a means to satisfy the Owner of contract compliance and as assurance to the Owner of Contractor quality control performance:
  - 1. Roof Top Air Conditioning Units
  - 2. Unit Heaters – Gas Fired
  - 3. Unit Heater – Electric
  - 4. Air Handling Units
  - 5. Dedicated Outdoor Air System
  - 6. Heat Reclaim Coils
  
- B. Kitchen Exhaust Hood, Exhaust Fan, and Fire Suppression System:
  - 1. The Owner’s Fire Protection Consultant will perform the following testing and observation in accordance with Section 01454 of this Appendix:
    - a. Schedule observation and acceptance testing in conjunction with the final fire sprinkler system observation.
    - b. Contact hood manufacturer to obtain fire suppression system supplier’s contact information.
    - c. Coordinate observation and acceptance testing schedule of fire suppression system with Contractor.
    - d. Prior to observation and acceptance testing, obtain drawings approved by AHJ from fire suppression system supplier.
  - 2. The Owner’s fire suppression system supplier will perform the following.
    - a. Send drawings approved by AHJ to Owner’s Fire Protection Consultant and provide one copy of drawings for use on site during observation and testing acceptance.
    - b. Verify fire suppression system installation and connections are complete and properly functioning prior to the acceptance test.
    - c. Provide multiple activations of the system necessary to complete the acceptance testing as follows:
      - 1) Perform acceptance testing in accordance with the ANSUL R-102 Design Manual in the presence of Owner’s Fire Protection Consultant.
      - 2) Actuate the system to demonstrate proper installation and piping connections (such as balloon test to confirm nozzle operation).
      - 3) Demonstrate device connections including fusible links and manual activation device.
      - 4) Demonstrate proper operation of shunt trip breaker, emergency gas shut-off valve, and signal activation to the building fire alarm.
      - 5) Demonstrate proper sequence of events for additional items required by AHJ or ANSUL R-102 Design Manual as required for acceptance of system including but not limited to fan and ventilation interlocks.
    - d. Additional charges incurred by Owner’s Fire Protection Consultant and Contractor due to fire suppression system supplier’s lack of preparation shall be paid by fire suppression system supplier.
    - e. Modification for proper system performance will be made at the time of observation and acceptance test when practical. Expenses incurred for additional acceptance tests due to the lack of proper operation will be the charged to the fire suppression system supplier.

A. Functional Performance Testing (FPT): FPT will be conducted by Engineer of Record at no cost to the Contractor in accordance with Section 01454. FPT will be performed after Owner’s possession date. Deficiencies noted and related to the Contractor’s installation responsibilities shall be corrected prior to Grand Opening.

B. Functional Performance Testing (FPT) forms are included at the end of this Appendix A.

**SECTION 16050 – BASIC ELECTRICAL MATERIALS AND METHODS**

**2.1 OWNER TESTING AND INSPECTION (T&I):**

- A. Owner’s Power Systems Study Engineer (PSSE): Upon substantial completion of electrical work, Owner’s Power Systems Study Engineer (PSSE) will perform testing and inspections to ensure compliance of equipment and accuracy of settings in accordance with NFPA 70E. PSSE will perform testing and inspection site visits at no cost to the Contractor.
  
- B. PSSE’s testing and inspections will include but may not be limited to the following:
  - 1. Panel directory accuracy verification.
  - 2. Breaker settings verification.
  - 3. Deviation Log establishment and maintenance.

4. Final arc flash label application.

C. PSSE assigned to project is as follows:

1. Company Name: Click or tap here to enter text.
2. Point of Contact Name: Click or tap here to enter text.
3. Telephone(s): Click or tap here to enter text.
4. Contact email address(es): Click or tap here to enter text.

D. The activities and responsibilities of the PSSE shall not preclude any quality control responsibilities by the Contractor as specified in Specifications Section 16050.

E. The PSSE is not authorized to change any specified requirement.

## 2.2 SEQUENCING AND SCHEDULING

A. Contractor will contact PSSE prior to completion of electrical work to schedule a site visit by PSSE as described in Specifications Sect 16050.

B. Contractor shall establish temporary breaker settings prior to PSSE's visit.

END OF APPENDIX

**Walmart Building Performance Verification Program**  
**Initial / Intermediate / Final FPT Report**

Store No., City, and State:	
Report Date:	
Initial FPT Date:	
Initial FPT Person, Org.:	
Initial Walmart BPT Person/Phone	
FOLLOW-UP FPT REQUIRED? YES OR NO	
Follow-up FPT Date:	
Follow-up FPT Person, Org:	
Follow-up Walmart BPT Person/Phone	
BAS Vendor:	

The following summarizes the mechanical and electrical equipment tested in accordance with the Walmart Building Performance Verification Program.

Equipment	Pass / Fail	Deviation Number(s)
AHUs		Note: If deviations occur two times or more all RTUs need to be checked.
RTUs		Note: If deviations occur two times or more all RTUs need to be checked.
Emergency HVAC Shutdown		
Air Curtains		
Unit and Radiant Heaters		
Exhaust Fans		
Automated Lighting Controls		
Occupancy Sensors		
Energy Sub-Metering		
Sinks: Confirm all HW Temperature and Delivery Time		

**Notes:**

[Sample notes....  
Refer to attached Open FPT Deviations List.  
AHU Gas Heat was not tested beyond Stage 1 because outside air temp was too warm.  
Unable to test RTU cooling and AHU cooling/dehumid because outside air temp was too cold.]

END OF FORM "INITIAL/INTERMEDIATE/FINAL FPT REPORT"

## *Walmart Building Performance Verification Program*

### **Plumbing Hot Water Functional Performance Test**

Store No., City, and State: \_\_\_\_\_

Date and Time of Test: \_\_\_\_\_

Name and Organization of Testing Person: \_\_\_\_\_

**Sinks:**

Step	Operation Tested:	FPT Override: <i>When test is complete, release all overrides</i>	Expected Results:
1	<b>Sinks:</b>  Confirm all Sinks supplying water at the proper temperature and delivered at the proper time delay  including: Restroom, Bakery, Deli and Produce sinks	N/A:	

	<b>Sink Water Time to reach hot water temperature Test</b>	With timer confirm water is reaching temperature at required time.	
	<b>Sink Water Temperature Test</b>	Confirm sink water temperatures are being controlled by TMVs at 105F (Confirm temperature listed on Plumbing Schedules)  Use temperature sensor in water flow to confirm temperatures on all sinks within sensor margin of error.	

END OF FORM "WM PLUMBING HOT WATER FPT"

## *Walmart Building Performance Verification Program*

### **Electrical Lighting Systems Functional Performance Test**

**Dimming Functional Performance Test:**

**1. Notify Store Manager before testing light dimming.**

<b>Step</b>	<b>Operation Tested:</b>	<b>FPT Override:</b> <i>When test is complete, release all overrides</i>	<b>Expected Results:</b>
<b>1</b>	<p><b>PARAMETERS:</b></p> <p>BPT verify sales floor night light dimming is correct by BAS system prior to FPT</p>	<p><b>ALL:</b> n/a</p>	<p><b>ALL:</b> Lights should be scheduled to dim by about 10% during the evenings.</p>
<b>2</b>	<p><b>LIGHTS at FULL BRIGHT:</b></p> <p>Verify Lights are at full bright during occupied hours.</p>	<p><b>Honeywell (NOVAR):</b> On the Sales Floor or Grocery Lighting Screens.</p> <ol style="list-style-type: none"> <li>1. Change the minimum ON time parameter to 0 minutes</li> <li>2. Observe the ALS foot-candle reading.</li> <li>3. Raise the dimming reset range to a level above the ALS reading</li> </ol> <p><b>Copeland :</b></p> <ol style="list-style-type: none"> <li>1. Change the minimum ON time parameter to 0 minutes</li> <li>2. Force the indoor ALS light level sensor input to a level below the dimming foot-candle range.</li> </ol>	<p><b>ALL:</b></p> <p>Verify the dimmer control input on the light dimming monitoring page is 9 volts.</p> <p>Verify sales floor light level is uniform and appears to be full bright.</p> <p>Verify transition from dim to full bright is smooth and takes approximately 1 minute to transition from full dim to full bright</p> <p>Verify the lamp color temperature is visually consistent.</p>
<b>3</b>	<p><b>LIGHTS at DIM:</b></p> <p>Verify Lights are capable of dimming.</p>	<p><b>Honeywell (NOVAR):</b></p> <ol style="list-style-type: none"> <li>1. Observe the ALS foot-candle reading.</li> <li>2. Lower the dimming reset range to a level below the ALS reading</li> </ol> <p><b>Copeland :</b></p> <ol style="list-style-type: none"> <li>1. Force the indoor ALS light level sensor input to level above the above the dimming foot-candle range.</li> </ol>	<p><b>ALL:</b></p> <p>Verify the dimmer control input on the light dimming monitoring page is 1 volt.</p> <p>Verify sales floor light level is uniform in and appears have dimmed.</p> <p>Verify transition from bright to dim is smooth and takes approximately 1 minute to transition from full bright partially dimmed.</p>

FUNCTIONAL TESTING NOTES:

**Controlled Receptacles:**

Step	Operation Tested:	FPT Override: <i>When test is complete, release all overrides</i>	Expected Results:
1	<p><b>Installation:</b></p> <p>Verify receptacles provided with automatic control function as noted on drawings.</p>	N/A:	<p>Occupancy sensor controlled receptacles: receptacles are energized/de-energized based on occupancy sensor settings for room where located.</p> <p>Time-switch controlled receptacles: receptacles are energized/de-energized based on time schedule.</p>

**Occupancy Sensors:**

Step	Operation Tested:	FPT Override: <i>When test is complete, release all overrides</i>	Expected Results:
1	<p><b>Installation:</b></p> <p>Verify occupancy sensor areas within the store are functioning per the Occupancy Sensor Notes.</p>	N/A:	<p>All occupancy sensors are installed and the bi-level switching is operational according to the plans.</p> <p>Verify manual-on mode programmed correctly according to the notes.</p> <p>For all occupancy sensors verify the following:</p> <ul style="list-style-type: none"> <li>• Controlled lights turn off or down to the permitted level within the required time.</li> <li>• For auto-on occupancy sensors, the lights turn on to the permitted level when someone enters the space.</li> <li>• For manual-on occupancy sensors the lights turn on only when manually activated.</li> <li>• The lights are not incorrectly turned on by movement in nearby areas or by HVAC operation.</li> </ul>

**Scheduled Lighting - ON – OFF Functional Performance Test:**

Step	Operation Tested:	FPT Override: <i>When test is complete, release all overrides</i>	Expected Results:
1	<p><b>PARAMETERS:</b></p> <p>Verify the lighting ON / OFF parameters are per the schedule.</p>	<p><b>ALL:</b></p> <p>n/a</p>	<p><b>ALL:</b></p> <p>Correct program parameters are loaded.</p> <ul style="list-style-type: none"> <li>• Weekday, weekend and holiday (as applicable) schedules</li> <li>• Correct time and date set.</li> </ul>
2	<p><b>LIGHTS ON</b></p> <p>Verify the lights turn ON per the schedule.</p>	<p><b>All:</b></p> <ol style="list-style-type: none"> <li>1. BPT will disable the outside daylight sensor for the exterior lights, do not cover sensor).</li> <li>2. Adjust the lighting area ON time to a point just after the current system time clock.</li> </ol>	<p><b>ALL:</b></p> <p>Verify lights turn ON.</p>
3	<p><b>LIGHTS OFF</b></p> <p>Verify the lights turn OFF per the schedule.</p>	<p><b>All:</b></p> <ol style="list-style-type: none"> <li>1. Adjust the lighting area OFF time to a point just after the current system time clock.</li> </ol>	<p><b>ALL:</b></p> <p>Verify lights turn OFF.</p>
4	<p><b>MANUAL CONTROL</b></p>	<p><b>All:</b></p>	<p><b>ALL:</b></p>

	Verify the lights turn ON and OFF by their respective area control switch during occupied condition.		Verify all lights can be turned ON and OFF by their respective area control switch. The switch only operates lighting in the area designated on the drawings.
<b>5</b>	<b>MANUAL OVERRIDE CONTROL</b>  Verify the lights turn ON.	<b>All:</b>	<b>ALL:</b>  Verify all lights in the space controlled by the switch turn ON or remain ON until the next scheduled shutoff occurs (maximum of 2 hours per activation of override).

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RELEASE ALL OVERRIDES AND PLACE ALL SETPOINTS BACK TO DESIGN CONDITIONS WHEN FINISHED

Notes:

1. Building Performance Team: Primary Contact: (479) 204-0432; Alternate Contact: (479) 204-2256.
2. In event equipment does not function, verify breaker at panel and disconnect switch is turned ON. Do not troubleshoot deficiencies beyond this.
3. Note Project BASS Vendor: \_\_\_\_\_

Document Revision History

END OF FORM "WM ELECTRICAL LIGHTING SYSTEMS FPT"

# *Walmart Building Performance Verification Program*

## Novar Light Dimming BAS Parameters

Store No., City, and State: \_\_\_\_\_

Date and Time of Test: \_\_\_\_\_

### *ECLIPSE DIMMER*

1)	Program Operating Mode	Run
2)	Constants	P < 0.1875 > I < 0.1250 > D < 0.0625 >
3)	Actuator Type	Fan/Motor Speed - Direct Acting
4)	Control Limits	Low 10.00% High 90.00 % Output
5)	Sampling Time	0 min. 5 sec.
6)	Control Inputs	Local Dimmer Control
7)	Schedule On Reset	Local ALS PLC 100-5k
8)	Schedule Off Set-point	Max Position
10)	Set-point Range	10% to 90% OUTPUT
11)	Reset Range	20 sec. 1800 to 800 FTCNDL
13)	Input Control Limit	10%OUTPT
17)	Site Emergency	Active
18)	Site / Network Emergency State	Max Position
19)	Local Emergency State	Max Position Pt 1 ALS PLC 100-5k
23)	Local / Network Sequence Off Position	Standby
24)	Local Sequence	Inhibited for 0 sec. after L 49 is On
25)	Alarm on Maintenance OVR	Active
26)	Analog Output Scaling	0 to 100 %OUTPT

### *SALES FLOOR ON / OFF*

1)	Program Operating Mode	Run
2)	Output Activated State	ON
3)	Confirmed Status	Inactive
3)	Reconfirmation Status	Manual
5)	Schedule On / Off	2200 FTCNDL (GM Sales Floor)
7)	Set-point Diff	400 FTCNDL
11)	Minimum On Time	60 min.
19)	Site Emergency	Active
20)	Site Network Emergency Load State	On
21)	Local Emergency Load State	On Point ALS PLC 100-5k
26)	Alarm on Maintenance OVR	Active

CPC:

DANFOSS:

END OF FORM "NOVAR LIGHT DIMMING BAS PARAMETERS"



## *Walmart Building Performance Verification Program*

### **Supercenter Electrical Lighting Systems FPT Checklist**

Store No., City, and State: \_\_\_\_\_

Date and Time of Test: \_\_\_\_\_

BAS Vendor: \_\_\_\_\_

Name and Organization of Testing Person: \_\_\_\_\_

**Note: Verify with BPT Interior Lighting and Exterior Lighting Override Routine is off.**

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#### **Day Lighting Systems:**

Area	Pass / Fail	Notes and Corrective Action
<b>Sales Floor Full Bright</b>	-	-
<b>Sales Floor 50% Dim</b>	-	-

**Exterior Lighted Areas:**

Area	Pass / Fail	Notes and Corrective Action
<b>Parking Lot Lighting</b>	-	-
	-	
	-	
	-	
	-	
	-	

**Occupancy Sensor Areas:**

Area	Pass / Fail / N/A	Notes and Corrective Action
<b>Managers Office</b>	-	-
<b>Training Room (CBL)</b>	-	-
<b>Break Room</b>	-	-
<b>UPC / UPS Room</b>	-	-
<b>AD Office</b>	-	-
<b>Personnel</b>	-	-
<b>Invoicing Room</b>	-	-
<b>Restrooms</b>	-	-
<b>Pharmacy Restroom</b>	-	-
<b>Customer Service</b>	-	-
<b>Return Storage</b>	-	-
<b>Mechanical Rooms</b>	-	-
<b>Coolers and Freezers</b>	-	-
<b>Auto Center Restroom</b>	-	-
<b>Optical Sales</b>	-	-
<b>Closets</b>	-	-
<b>Alcoves</b>	-	-
<b>Corridors</b>	-	-

**Miscellaneous Notes or Comments:**

Area	Notes and Corrective Action

END OF FORM "SUPERCENTER ELECTRICAL LIGHTING SYSTEMS FPT CHECKLIST"

## *Walmart Building Performance Verification Program*

### **Walmart Air Handling Units - Munters Gas Fired/Dehumid AHU, Air-Cooled DX: HCUC Functional Performance Test**

Store No., City, and State: \_\_\_\_\_

Date and Time of Test: \_\_\_\_\_

Equipment Tag (Area Served): \_\_\_\_\_

Equipment Type: \_\_\_\_\_

Manufacturer and Model: \_\_\_\_\_

Name and Organization of Testing Person: \_\_\_\_\_

**CONTACT WALMART ALARM CENTRAL AT 479-273-4600 PRIOR TO FPT TO NOTIFY THAT RTUS WILL BE TURNED OFF DURING TEST**

**Setpoints Reference (the setpoints can change; verify with BPT they are set and current). Setpoints should be per latest prototype direction unless changes are required based on site specific conditions.**

Zone DH sp	Zone DH Setpoint (Zone DP)	52
Zone DH Deadband	Zone F DP Deadband	2
Amb DH setpoint	Amb DH Override Setpoint (Amb DP)	48
Amb Cool sp	Amb Cool Override Setpoint	85
Zone Cool sp	Zone Cool Setpoint (Zone DB)	76
Zone Cool db	Zone Temp Deadband	2
Zone Heat sp	Zone Heat Setpoint (Zone DB)	68
Amb Temp Ht 1 On	OSA F Heat Override On (L/O)	55
Amb Temp Ht 2 On	OSA F Heat Override On (L/O)	30
Amb Temp Ht 3 On	OSA F Heat Override On (L/O)	10
Amb Temp Ht 4 On	OSA F Heat Override On (L/O)	0
Stage On Delay	Heat/DH/Cool stage on delay	10
Stage Off Delay	Heat/DH/Cool stage off delay	10
<b>Munters Internal Compressor Protection Setpoints</b>		
N/A	Compressor C & D DH and Cool Ambient Lockout (Compressors re-enabled 3F > ambient)	≤ 65
N/A	Compressor A & B DH and Cool Ambient Lockout (Compressors re-enabled 3F > ambient)	≤ 45
N/A	If coil temperature remains ≤ 36°F on A-C (B-D) coil for 180 seconds, the compressor C (B) de-energizes for minimum off time. Coil must be > 40°F for compressor restart.	

N/A	If any compressor's suction pressure is ≤ 90 psi, the compressor will not start. If suction pressure drops to 90 psi after compressor is	
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	running, it will de-energize immediately after minimum on time has elapsed. Restart occurs if pressure > 90 psi after minimum off time has elapsed.	
N/A	If any compressor's discharge pressure reaches 570 psi, the compressor de-energizes for 10 minutes. After 10 minutes, the compressor will restart. If compressor A is de-energized, the desiccant wheel and reactivation fan also de-energize.	

**Procedural Notes**

- BEFORE traveling to the site, the EOR shall ask BPT to check software versions. The Cooling and Heating staging overrides work with current Munters firmware v1.27 and BACnet 4.3 in BAS vendor program. This confirms there is now capability to reduce heating and cool stage time delays.  
If the software versions were not updated as described above, BPT will be aware that time delays will likely not be adjustable, resulting in longer FPT test times and compromising testing of all the stages of heating and cooling. BPT may elect to contact Munters to send a representative to the site to upgrade to the v1.27.  
If a Munters AHU was shipped prior to 2022, contact BPT for guidance on FPT procedure. The ALC software was not updated prior to 2022.
- During gas heating if leaving air temperature exceeds 130F (Carel) or 115 F (ALC) prior to enabling all stages of gas and elec heat, subsequent heating stages will be locked out. Also, if leaving air temperature exceeds 165F (Carel) or 135F (ALC) during heating operation, the highest stage of heat will be disabled. Additional heat stages will be shut off if the leaving air temperature remains above 165F (Carel) or 135 (ALC) for the 'stage down delay' time period. Therefore, it may not be possible to physically enable all gas stages if testing during summer conditions. And, when conducting ambient override test, releasing zone call override would normally disable highest heat stage (if zone temp  $\geq$  setpoint + 2F), but may not since highest heat stage has already been disabled due to the leaving air temperature exceeding 165F (Carel) or 135F (ALC). If leaving air temperature exceeds 200F, all heat will be shut off until leaving air temperature falls to 100F. If any of the Cooling or Dehumidification processes are running, the Cooling and Dehumidification Compressor sequencers will actively prevent more compressors from coming on if the DX Leaving Air Temperatures are below 38°F. This is to protect the compressors from low suction superheat which will damage the compressors. This applies to the Room Cooling and Room DH Simulation modes.
- Heating based on zone call or ambient override. For zone call heating stages up until zone is satisfied. During ambient override if the zone temperature is  $\geq$  zone temperature setpoint + deadband (2F), the highest heat stage is dropped in order to prevent overheating the zone. This is why during the ambient override test the zone heating setpoint is set 1F lower than the current zone temperature.
- When performing the FPT test the heating function during the coolest part of the day and, if necessary, switch between heating and cooling testing to avoid overheating supply air. During hot weather test the heating after the leaving air temperature has been lowered to less than 60F.  
Test heat as far as unit safeguards will allow.
- The AHU controller receives indication of internal faults. The AHU will attempt to restart component after fault, and if unsuccessful the AHU will shutdown unit. The AHU transmits a generic fault indication and shutdown alarm to building automation system. Description of the specific fault or shutdown condition is displayed at the AHU.  
During testing if heating is the last function to be tested, allow the supply fan to operate for a few minutes to lower leaving air temperature before testing loss of power.
- When supply fan is enabled from building automation system (fan normally operates continuously), Munters unit provides fan status signal back to BAS. When fan status is lost while enable command is ON, all heating and cooling will shut down and AHU provides supply fan fault alarm to BAS. Verify status signal received at BAS and test that when status is lost AHU is shutdown and alarm received at Monitoring (loss of power).
- Munters internal compressor protection setpoints may lock out compressor operation during testing in cool weather so, therefore, perform the FPT tests involving compressor operation during the warmest part of the day. These setpoints cannot be changed by the BAS.
- For projects with Copeland and NOVAR OPUS BAS, BPT can force individual sensor values during FPT instead overriding setpoints. Setpoint override is currently required for projects with legacy NOVAR controls.

9. FPT ON/OFF LOGIC  
 DH/COOL:  
 STPT > AMB/SPACE = OFF  
 STPT < AMB/SPACE = ON

Heating:  
 STPT < AMB/SPACE = OFF  
 STPT > AMB/SPACE = ON

**DEHUMIDIFICATION MODE**

For this test, remove zone heating and cooling calls through BAS:

Record current zone temperature = \_\_\_\_\_ F DB

Override Zone Heat Setpoint to 10F less than current zone temperature, override = \_\_\_\_\_ F DB.

Override Ambient Zone Cooling Setpoint to 10F greater than current Ambient temperature, override = \_\_\_\_\_ F DB

#	Pass/Fail	Operation Tested	FPT Override: When test is complete, release all overrides	Expected Results	Notes
1		<b>Compressor Staging</b>	BPT reset compressor stage delay On/Off timers to 1 minute each	AHU Controller Display Staging on: 1 min Staging off: 1 min	
2		<b>Unit Operation with Supply Fan Only</b>	Override Amb DH Setpoint to 10F above current ambient dewpoint and override Zone DH Setpoint to 10F above current zone dewpoint	AHU operates in fan only mode and without compressors operating Amb DH Actual = _____ F DP Override = _____ F DP  Zone DH Actual = _____ F DP Override = _____ F DP	Allow AHU to operate in this mode for minimum 5 minutes in order for any compressor minimum off time delays to expire  Supply Fan VFD Speed (Hz) _____
3		<b>Dehumid Stages Up Based on Ambient</b>	Override Amb DH Setpoint to minimum 3F below current ambient dewpoint	Afterheat is locked out, desiccant wheel ON, bypass damper closed, DH Stage 1 (compressor A) ON Amb DH Actual = _____ F DP Override = _____ F DP	Supply fan VFD speed signal increases to maintain airflow at increased static pressure since all airflow passes through wheel VFD Speed (Hz) _____
3a		<b>WNM Only – Zone Heat Operation during Dehumid – PERFORM ENTIRE HEATING MODE – ZONE CALL TEST AT THIS POINT</b>			
4		<b>Space Cooling Call during Ambient DH</b>	Override Space Zone Cooling Setpoint to 10F Less than current Ambient temperature, override = _____ F DB .	Afterheat is locked out, desiccant wheel ON, bypass damper closed, DH Stage 1 (compressor A) remains ON Compressor D ON  Note: If Ambient temp is below 65F compressors C and D are lock out. In this case Compressor B rather than D will be brought on.  Amb DH Actual = _____ F DP Override = _____ F DP	Supply fan VFD speed signal increases to maintain airflow at increased static pressure since all airflow passes through wheel VFD Speed (Hz) _____  Allow AHU to operate in this mode for minimum 5 minutes in order for any compressor minimum off time delays to expire  Supply Fan VFD Speed (Hz) _____
5		<b>Dehumid Stages Up Based on Zone</b>		After 1 minute delay and compressors A and B ON, DH Stage 3 (compressor C) ON	Supply fan VFD speed remains at present speed

#	Pass/Fail	Operation Tested	FPT Override: When test is complete, release all overrides	Expected Results	Notes
6		<b>Dehumid Stages Up Based on Zone</b>		After 1 minute delay and compressors A, B, and C ON, DH Stage 4 (compressor D) ON	Supply fan VFD speed remains at present speed
<p><b>The previous step in the test will determine whether the AHU is in Humidity Priority Mode or Temperature Priority Mode.</b>  Once all four compressors are on if the desiccant wheel remains on (while there is still a space call for cooling ) that will confirm the AHU is in the Humidity Priority Mode.  However, if at this point in the test the desiccant wheel turns off it confirms the AHU is in Temperature Priority Mode.</p> <p><b>Notes:</b>  At Sales Areas the AHUs are Typically Set to Humidity Priority.</p> <p><b>In the Humidity Priority Mode,</b> DH control will take precedence over Temperature control in the Space. During the DH mode, the desiccant wheel will remain engaged even if the sensible temperature in the space drifts above the temperature set point.</p> <p>In some spaces such as the MFC, the AHUs may be set to Temperature Priority.  <b>In the Temperature Priority Mode,</b> controlling the Space Temperature will take precedence over the DH control in the Space. During the Temperature Priority Mode, if all four compressors are on during DH mode (wheel on) and the temperature in the space drifts above the Space setpoint, the desiccant wheel will disengage to allow the space to return to its sensible setpoint.</p>					
7		<b>Dehumid Stages Down Based on Zone</b>	Release Zone DH Setpoint override OR override Zone DH Setpoint to 55F Override Amb DH Setpoint to 10F Above current ambient dewpoint	Dehumid stages off in reverse order (compressors D, C, B, A) in 1 minute stage delays, desiccant wheel OFF, bypass damper open	Supply fan VFD speed signal decreases VFD Speed (Hz) _____ (should match step 2)
8		<b>Ambient call for cooling during DH mode</b>	Override Ambient Zone Cooling Setpoint to 10F Less than current Ambient temperature, override = _____ F DB .	After 1 minute delay compressor D ON	No DH and one stage of cooling based on Ambient now operating
9		<b>Ambient call for cooling during DH mode</b>	Override Amb DH Setpoint to minimum 3F below current ambient dewpoint	Afterheat is locked out, desiccant wheel ON, bypass damper closed, DH Stage 1 (compressor A) ON (Along with Cooling Compressor D)  Note: If Ambient temp is below 65F compressors C and D are lock out. In this case Compressor B rather than D will be brought on.  Amb DH Actual = _____ F DP Override = _____ F DP	Supply fan VFD speed signal increases to maintain airflow at increased static pressure since all airflow passes through wheel VFD Speed (Hz) _____  Allow AHU to operate in this mode for minimum 5 minutes in order for any compressor minimum off time delays to expire  Supply Fan VFD Speed (Hz) _____
10		<b>Ambient call for cooling during DH mode</b>	Override Zone DH Setpoint to 3F below current zone dewpoint Override Amb DH Setpoint to 10F above current Amb DH to remove Amb DH call,	After 1 minute delay and compressor A ON, DH Stage 2 (compressor B) ON (Along with Cooling Compressor D) Zone DH Actual = _____ F DP Override = _____ F DP Amb DH Actual = _____ F DP Override = _____ F DP	Supply fan VFD speed remains at present speed The reactivation fan VFD ramps up and down between 3 to 30 Hz as the unit is maintaining a head pressure of 444 Psi. The scavenged heated air reactivates the DH wheel in the Dehumidification Process

#	Pass/Fail	Operation Tested	FPT Override: When test is complete, release all overrides	Expected Results	Notes
11		<b>Ambient call for cooling during DH mode</b>	Dehumid Stages Up Based on Zone	After 1 minute delay and compressors A and B ON, DH Stage 3 (compressor C) ON (Along with Cooling Compressor D)	Supply fan VFD speed remains at present speed
12		<b>Ambient call for cooling during DH mode</b>	Override Zone DH Setpoint to 10F above current zone dewpoint	Dehumid stages off in reverse order (compressors C, B, A) in 1 minute stage delays, desiccant wheel OFF, bypass damper open. (Cooling Compressor D remains on)	Supply fan VFD speed signal decreases VFD Speed (Hz) _____
13		<b>Ambient call for cooling during DH mode</b>	Override Ambient Zone Cooling Setpoint to 10F above the current Ambient temperature, override = _____ F DB.	Cooling stage D off 1 minute stage delay, desiccant wheel remains OFF, bypass damper remains open	Supply fan VFD speed remains at present speed Reset staging delay time settings to 10 minutes at completion of FPT  AHU now in fan only operation.
14		<b>Condenser Fan Operation</b>		Confirm condenser fan operation during Dehumid stages	

**HEATING MODE – AMBIENT CALL**

**For this test, remove dehumid and space heat and cool calls through BAS:**

**Record current Zone DH = \_\_\_\_ F DP, Ambient DH = \_\_\_\_ F DP, Zone Temp = \_\_\_\_ F DB**

**Override Zone DH Setpoint to 10F above current zone DH temperature, override = \_\_\_\_ F DP.**

**Override Ambient DH Setpoint to 10F above current ambient DH temperature, override = \_\_\_\_ F DP.**

**Override Zone Cool Setpoint to 10F above current zone temperature, override = \_\_\_\_ F DB.**

**Override Zone Heat Setpoint to 1F below current zone temperature, override = \_\_\_\_ F DB.**

#	Pass/Fail	Operation Tested	FPT Override: When test is complete, release all overrides.	Expected Results	Notes
1		<b>Heater Staging</b>	Stage delay On/Off timers are 10 minutes each.	AHU Controller Display Staging on: 10 min. Staging off: 10 min.	
2		<b>Heating Stages Up Based on Ambient</b>	Override all Amb OSA Temp Ht On setpoint to minimum 3F above current ambient temperature.  Amb Temp. Actual = ____ F DB Override = ____ F DB	After 3 minute delay, Heating module 1 on bottom (stages 1 and 2) energize, after successful fire (30-60 sec delay) high heat stage 2 de-energizes After 3 minute delay, heating module 1 stage 2 energizes After 3 minute delay, heating module 2 on top (stages 3 and 4) energize, after successful fire (30-60 sec delay) high heat stage 4 de-energizes After 3 minute delay, heating module 2 stage 4 energizes Desiccant wheel remains OFF and bypass damper remains OPEN for all heating stages on elec heat there is no de-energize, only 3 min staged intervals.	Supply fan VFD speed remains at present speed.  Note: Amb Temp Ht On setpoints shown on single BAS screen, so overrides could be done all at once then heat energized based on stage delay times.
3		<b>Heating Stages Down Based on Zone</b>	Release Amb Temp Ht 4 On override.  Override Zone Heat Setpoint to 3F below current zone temperature.	Heating module 2 stage 4 de-energizes (no delay on OFF).  Overriding zone heat setpoint 3F de-energizes heat 4 stage (if not shutdown first by high leaving air temperature).	Supply fan VFD speed remains at present speed.  3F override required on account of rounding within AHU Controller program.
4		<b>Heating Stages Down Based on Ambient</b>	Release Amb Temp Ht 3 On override.	Heating module 2 stage 3 de-energizes (no delay on OFF).	Supply fan VFD speed remains at present speed.
5		<b>Heating Stages Down Based on Ambient</b>	Release Amb Temp Ht2 On override.	Heating module 1 stage 2 de-energizes (no delay on OFF).	Supply fan VFD speed remains at present speed.
6		<b>Heating Stages Down Based on Ambient</b>	Release Amb Temp Ht1 On override.	Heating module 1 stage 1 de-energizes (no delay on OFF).	Supply fan VFD speed remains at present speed.



**COOLING MODE**

**For this test remove dehumid and space heat calls and compressor lockouts through BAS:**

**Record current Zone DH = \_\_\_\_\_ F DP, Ambient DH = \_\_\_\_\_ F DP, Zone Temp = \_\_\_\_\_ F DB**

**Override Zone DH Setpoint to 10F above current zone DH temperature, override = \_\_\_\_\_ F DP.**

**Override Ambient DH Setpoint to 10F above current ambient DH temperature, override = \_\_\_\_\_ F DP.**

**Override Zone Heat Setpoint to 10F below current zone temperature, override = \_\_\_\_\_ F DB.**

**\*Note Ambient temperature compressor lockouts on page 1 of this FPT.**

#	Pass/Fail	Operation Tested	FPT Override: When test is complete, release all overrides	Expected Results	Notes
1		<b>Compressor Staging</b>	BPT reset compressor stage delay On/Off timers to 1 minutes each	AHU Controller Display Staging on: 1 min Staging off: 1 min	
2		<b>Cooling Stages Up Based on Zone</b>	Override Zone Cool Setpoint to 5F below current zone temperature	Afterheat is locked out, desiccant wheel OFF, bypass damper open, Cool Stage 1 (compressor D) ON Zone Cool Actual = _____ F DB Override = _____ F DB	Supply fan VFD speed remains at present speed
3		<b>Cooling Stages Up Based on Zone</b>		After 1 minute delay and compressor D ON, Cool Stage 2 (compressor C) ON	Supply fan VFD speed remains at present speed
4		<b>Cooling Stages Up Based on Zone</b>		After 1 minute delay and compressor D and C ON, Cool Stage 3 (compressor B) ON	Supply fan VFD speed remains at present speed
5		<b>Cooling Stages Up Based on Zone</b>		After 1 minute delay and compressors D, C, and B ON, Cool Stage 4 (compressor A) ON	Supply fan VFD speed remains at present speed Compressor A has an independent condenser coil. During cooling the reactivation fan VFD will ramp up and down to maintain 340 psi head pressure.
6		<b>Cooling Stages Down Based on Zone</b>	Release Zone Cool Setpoint override OR override Zone Cool Setpoint to 79F	Cooling stages off in reverse order (compressors A, B, C, D) in 1 minute stage delays, desiccant wheel remains OFF, bypass damper remains open	Supply fan VFD speed remains at present speed <b>Reset staging delay time settings to 10 minutes at completion of FPT</b>  <b>Release all overrides and return unit to steady-state operation and allow conditions to stabilize</b>
7		<b>Condenser Fan Operation</b>		Confirm condenser fan operation during cooling stages	

**HEATING MODE – ZONE CALL**

For this test, remove dehumid and space cool calls and ambient heat call through BAS:

Record current Zone DH = \_\_\_\_ F DP, Ambient DH = \_\_\_\_ F DP, Ambient Temp = \_\_\_\_ F DB, Zone Temp = \_\_\_\_ F DB

Override Zone DH Setpoint to 10F above current zone DH temperature, override = \_\_\_\_ F DP.

Override Ambient DH Setpoint to 10F above current ambient DH temperature, override = \_\_\_\_ F DP.

Override Zone Cool Setpoint to 10F above current zone temperature, override = \_\_\_\_ F DB.

Override Ambient Heat Setpoint to 3F below current ambient temperature, override = \_\_\_\_ F DB.

#	Pass/Fail	Operation Tested	FPT Override: When test is complete, release all overrides	Expected Results	Notes
1		Heater Staging	BPT reset stage delay On/Off timers to 3 minutes each	AHU Controller Display Staging on: 3 min Staging off: 3 min	Stage delays can be set to 1 minute for electric heat
2		Heating Stages Up Based on Zone	Override Zone Heat Setpoint to 1F above current zone temperature	After 3 minute delay, Heating module 1 on bottom (stages 1 and 2) energize, after successful fire (30-60 sec delay) high heat stage 2 de-energizes Zone Temp Actual = ____ F DB Override = ____ F DB Desiccant wheel remains OFF and bypass damper remains OPEN for all heating stages	Supply fan VFD speed remains at present speed
3		Heating Stages Up Based on Zone	Override Zone Heat setpoint to 1F above current zone temperature	After 3 minute delay, heating module 1 stage 2 energizes	Supply fan VFD speed remains at present speed  Space temp typically rises as heat stages on, requiring adjustment of Zone Heat setpoint.
4		Heating Stages Up Based on Zone	Override Zone heat setpoint to 1F above current zone temperature	After 3 minute delay, heating module 2 on top (stages 3 and 4) energize, after successful fire (30-60 sec delay) high heat stage 4 de-energizes	Supply fan VFD speed remains at present speed  <b>Note: Do not test this heating stage if actual OAT exceeds 30F</b>  Space temp typically rises as heat stages on, requiring adjustment of Zone Heat setpoint.
5		Heating Stages Up Based on Zone	Override Zone Heat setpoint to 1F above current zone temperature	After 3 minute delay, heating module 2 stage 4 energizes	Supply fan VFD speed remains at present speed  <b>Note: Do not test this heating stage if actual OAT exceeds 30F</b>  Space temp typically rises as heat stages on, requiring adjustment of Zone Heat setpoint.
6		Heating Stages Down Based on Zone	Release Zone Heat On override	After 3 minute delay, heating module 2 stage 4 de-energizes	Supply fan VFD speed remains at present speed

7		<b>Heating Stages Down Based on Zone</b>	Release Zone Heat On override	After 3 minute delay heating module 2 stage 3 de-energizes	Supply fan VFD speed remains at present speed
8		<b>Heating Stages Down Based on Zone</b>	Release Zone Heat On override	After 3 minute delay heating module 1 stage 2 de-energizes	Supply fan VFD speed remains at present speed
9		<b>Heating Stages Down Based on Zone</b>	Release Zone Heat On override	After 3 minute delay heating module 1 stage 1 de-energizes	Supply fan VFD speed remains at present speed
10		<b>Loss of Power:</b> Turn off power at unit disconnect	AHU goes through normal shutdown operation, control system generates a critical alarm to monitoring	BPT observes unit shut down	All unit functions are off Alarm Generation can take 20-30 minutes; BPT observation of unit shut down and verification of alarm programming is sufficient for test to Pass.
11		<b>Return of Power:</b> Turn on power at unit disconnect	AHU goes through normal start-up operation and system returns to normal operation	BPT observes unit start- up	

**RELEASE ALL OVERRIDES AND SETPOINTS BACK TO DESIGN CONDITIONS WHEN FINISHED**

Notes:

Building Performance Team: Primary Contact: (479) 204-0432; Alternate Contact: (479) 204-2256.  
 Verify indoor AHU space temp and DP sensors are in correct location.  
 In the event equipment does not function, verify breaker at panel and disconnect switch is turned ON. Do not troubleshoot deficiencies beyond this.  
 Project BAS Vendor: \_\_\_\_\_  
 Munters Contact Info  
 Mike Cashin: 210-380-3605, [Michael.Cashin@munters.com](mailto:Michael.Cashin@munters.com).  
 James Kendall: 210-241-8792, [James.Kendall@munters.com](mailto:James.Kendall@munters.com).  
 Munters AHU Controller Passwords: 78154M or Admin (EOR shall not adjust any settings in the AHU controller)

FUNCTIONAL TESTING NOTES:

Document Revision History

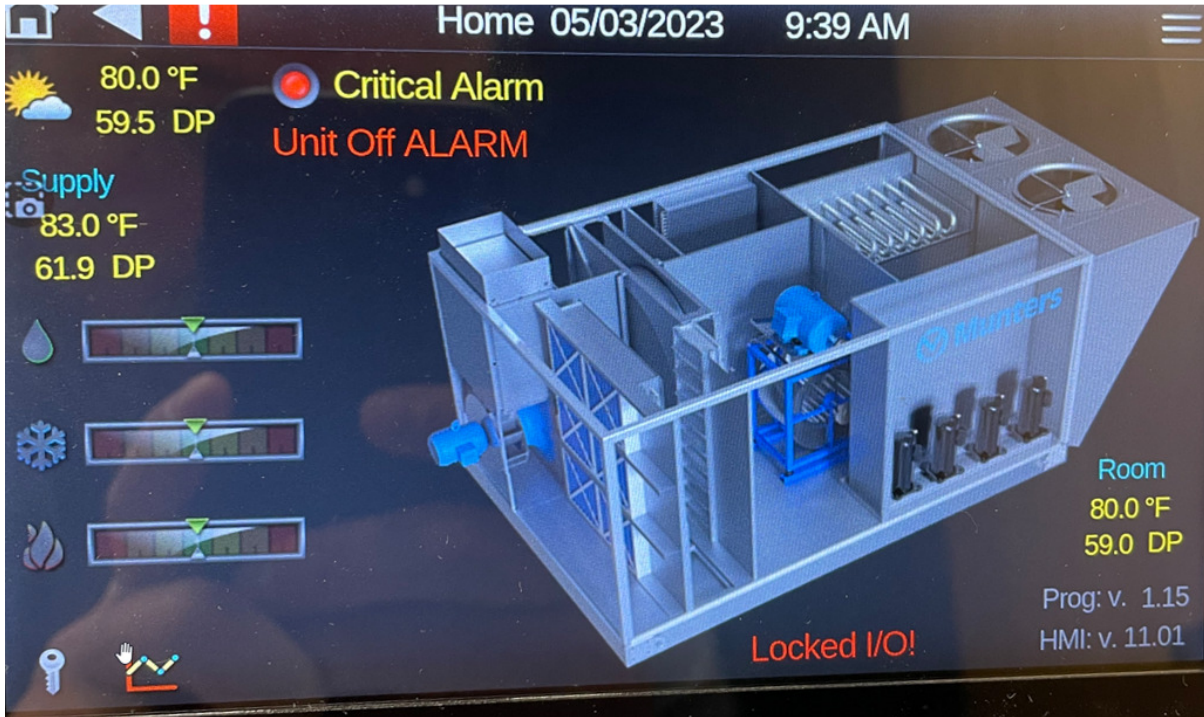
Proto Development – April 17, 2009  
 FPT EOR Training – July 7, 2009  
 Walmart, Munters & EOR Review and Comment – August 25, 2009  
 DI 9534 FPT Conference Call - October 28, 2009  
 Post-DI 9534 Call Issue – November 4, 2009  
 DI 9623 – January 14, 2010  
 DI 10035 – September 24, 2010  
 CI 11530 – FPT Best Practices – April 2012  
 CI 129484 – Update MEP FPT Forms July 2016  
 CI 31111 - FPT revision history is no longer recorded in this postscript log. For full description of revisions to FPT forms implemented after 07/25/14, see prototype specifications revision history.

Appendix

Refer to the Munters Installation-Operations Manual furnished with the unit and located in the controls compartment for additional information.

*Procedure for accessing ALC Status Screen*

**Tap on the ALC screen to open the Home Display**

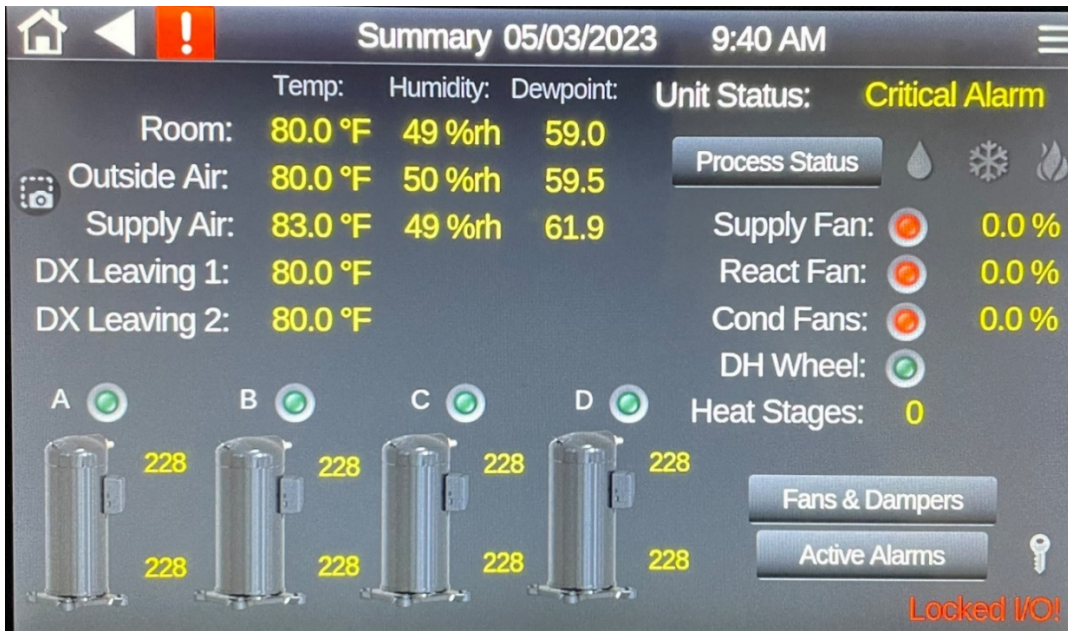


**Tap on the Three Line Menu at the upper right to access the “Menu”**

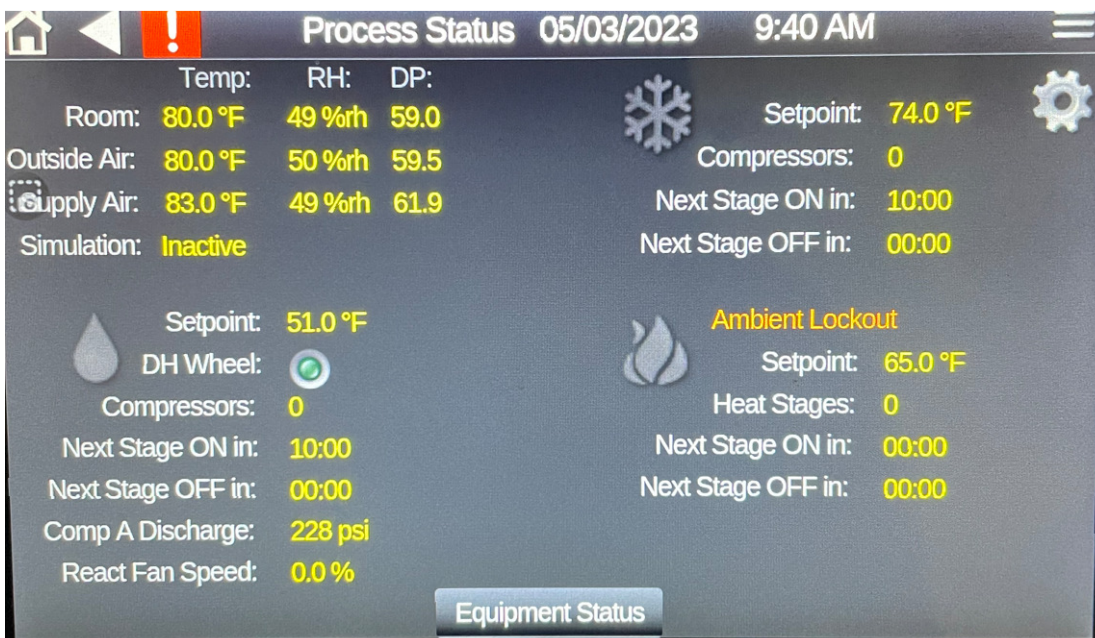


**Tap “Summary” to view the status of Fans, DH Wheel, Heating and Cooling Stages.**





Tap "Process Status" to view Cool, DH and Heating "Next Stage ON times".



END OF FORM "WALMART AIR HANDLING UNITS - MUNTERS GAS FIRED/DEHUMID AHU, AIR-COOLED DX: HCUC FUNCTIONAL PERFORMANCE TEST" AND APPENDIX



#	Pass/Fail	Operation Tested	FPT Override: <i>When test is complete, release all overrides</i>	Expected Results	Notes
		TRAVEL		demand  Auto/Cont fan set by Walmart BPT (Building Performance Team)	
4		<b>Fan Operation</b>  <b>OBSERVE CORRECT FAN OPERATION DURING FPT</b>	FPT Tester enables system operation (Power ON the unit if not already operating)  <b>Note:</b> It would be abnormal at this time for power not to be on at unit. If found in this condition note on FPT form, verify with Contractor unit is available for testing, or select another unit.	System operates in heating, economizer cooling, and/or mechanical cooling modes when space condition exceeds temperature set-points, fan operation continuous or cycles with call for heating or cooling (auto)	Note: OA damper should be closed when unit is off, OA damper opens to minimum when unit is on and not economizing, and unit is scheduled to deliver outside air.  Note: It may be difficult to visually confirm OA damper rotates from closed to minimum when unit enabled
5		<b>Space Temp Satisfied</b>  <b>OBSERVE CORRECT OPERATION DURING FPT</b>	BPT to set heating space temperature setpoint in BAS minimum of 1.0F less than the current indoor space temperature  OR  BPT to set cooling space temperature setpoint in BAS minimum of 1.0F greater than current indoor space temperature	Continuous Fan Mode: The supply fan runs continuously when the unit is set to this mode.  Auto Fan Mode: The fan turns off when there is no demand for heating or cooling in this mode.	Upon arrival at RTU determine whether unit is operating in heating or cooling then implement setpoint adjustment to disable heating or cooling. The setpoint for the non-operating mode can remain.
6		<b>Heating Demand #1</b>	BPT to set indoor space temperature setpoint (override) to current indoor space temperature (actual) plus minimum of 0.5F  Actual Temperature = _____ F DB  Temporary Override = _____ F DB  <b>Note:</b> the above operations required to test heat stage demand #1 may result in both heating stages being enabled at this point. This portion of the FPT will be accepted if this occurs.	Supply fan operates at Full Speed during all heating stages, OA damper remains at minimum.  Heat 1 energizes after delay to allow combustion air inducer to start and burner ignition to prove (approx 45 seconds)	Note: DO NOT physically test heat if ambient temp > 90F, just note heating could not be tested at this time  Burner will attempt to fire 3 times before being locked out
7		<b>Heating Demand #2</b>	BPT to set indoor space temperature setpoint (override) to current indoor space temperature (actual) plus minimum of 2.0F	Heat 2 energizes after delay (second stage of heat only on 5, 10 and 20 Ton units).	
8		<b>Heating Stage Down</b>	BPT to set indoor space temperature setpoint (override) to current indoor space temperature (actual) minus minimum of 1.0F  BPT to set heating setpoint to normal to avoid cycling heating during cooling test	Heat 1 and Heat 2 de-energize simultaneously due to default stage down timer of 0 seconds. Supply fan resets to Ventilation Speed for Continuous Fan units; fan OFF for Auto Fan units.	
9		<b>MSAV Units</b>	The MSAV RTUs have more than one supply fan speed. The fan speed varies depending on the mode the RTU is in.  For example, in the economizer mode the fan speed will be at the full speed.  The following steps address how the supply fan operates in various scenarios.		The FPT tester listens to the fan as it speeds up or slows down to verify that it is operating correctly.  The system defaults to a 5 minute delay between heating & cooling mode changeover.

#	Pass/Fail	Operation Tested	FPT Override: When test is complete, release all overrides	Expected Results	Notes
			MSAV units are 10 ton and 20 ton units only		FPT tester to short press the Reset Delay Button on the CORE Controller. (Reference Appendix)
10		<b>Cooling Demand #1 Economizer Only / DX Cooling with L/O</b>	<p>BPT to set outside air dewpoint (ODP) enable set-point to 10F higher than current outside air dewpoint temp.</p> <p>Actual Temperature = ____ F DP</p> <p>Temporary Override = ____ F DP</p> <p>BPT to set outside air dry bulb temperature (OTS) set point to 20F higher than current outside air temperature.</p> <p><b>Note: The above operations are required to test economizer function exclusive of mechanical cooling. However, even with these overrides, first stage cooling demand may enable DX cooling along with economizer. This portion of the FPT will be accepted if the combination of economizer and compressor operation occurs.</b></p>	Outside Air Damper enabled	
11		<b>Cooling Demand #1 Economizer Only / DX Cooling with L/O</b>	<p>With space satisfied, BPT to set indoor space temperature setpoint (Override1) to current indoor space temperature (actual) PLUS minimum 1.0 F DB.</p> <p>Actual Temperature = ____ F DB</p> <p>Temporary Override1 = ____ F DB</p>	<p>RTU Controller energizes economizer cooling; fan runs at Full Speed. Outside air damper opens from minimum to 100%, Compressors are off.</p> <p>Upon economizer OA damper reaching 100% open and a 10 minute delay and economizer unable to satisfy space temperature, compressor enabled</p>	If the outside air is below 55F the OSA damper will modulate to maintain the 55F supply air temperature.
12		<b>Cooling Demand #2 Economizer / Compressor #1</b>	<p>After outside air damper is fully open, FPT tester to short press the Reset Delay Button on the CORE Controller. (Reference Appendix)</p> <p>BPT to set indoor space temperature setpoint (Override) less than previous setting (Override) (see above) to enable Cooling Demand #2</p>	<p>Economizer damper reaches full open position then Compressor 1 energizes.</p> <p>Supply fan remains at Full Speed.</p>	Actual Override value will depend on offset produced by Override setpoint, but Override needs to result in offset greater than or equal to 1.0F to enable cooling demand #2
13		<b>Cooling Demand #3 Economizer / Compressors #1, 2</b>	<p>Cooling Demands #1 and #2 operate</p> <p>BPT to set indoor space temperature setpoint (Override) less than previous setting (Override) (see above) to enable Cooling Demand #3</p>	<p>Outside air damper remains full open, Compressor 2 energizes</p> <p>Supply fan remains at Full Speed.</p>	Actual Override value will depend on offset produced by Override setpoint, but Override needs to result in offset greater than or equal to 1.5F to enable cooling demand #3
14		<b>Cooling Demand #4 Economizer / All Compressors</b>	<p>Cooling Demands #1, #2, and #3 operate</p> <p>Set indoor space temperature setpoint (Override) less than previous setting (Override) (see above) to enable Cooling Demand #4</p>	<p>Outside air damper remains full open, Compressors and condenser fans 3 &amp; 4 energize</p> <p>Supply fan remains at Full Speed</p>	<p>Applies to 20 ton units</p> <p>Actual Override value will depend on offset produced by Override setpoint, but Override needs to result in offset greater than or equal to 2.0F to enable cooling demand #4</p>
15		<b>END Economizer / DX Cooling</b>	BPT to set indoor space temperature setpoint (override) to current indoor space temperature (actual) plus minimum 1.0F	Outside air damper closes to minimum position, Compressors 1-4 de-energize in reverse order	Due to stage delay times performing cooling testing on a maximum of two (2) RTUs simultaneously is



#	Pass/Fail	Operation Tested	FPT Override: <i>When test is complete, release all overrides</i>	Expected Results	Notes
			Actual Temperature = ____ F DB  Temporary Override = ____ F DB	Supply fan resets to Ventilation Speed for Continuous Fan units; fan OFF for Auto Fan units.	recommended. The Override needs to result in offset greater than or equal to 0.5F to disable cooling demands.
16		<b>Cooling Demand #1 Compressor #1 Only</b>	BPT to set outside air suitable setpoints to lockout economizer cooling  BPT to set outside dry bulb temperature enable setpoint 10F below current outside temperature  BPT to set outside dewpoint temperature enable setpoint 10F below current outside temperature  BPT to set indoor space temperature setpoint (override) to current indoor space temperature (actual) minus minimum 1.0F DB.	Lennox RTU Controller Outside Air Suitable (OAS) light is OFF  Compressor 1 energizes.  Supply fan speed operates at Stage 1 speed.  Cooling Demand without Economizer (unit size, tons) #1 = Comp 1 (all) #2 = Comp 2 (10, 20) #3 = Comp 1-3 (20) #4 = Comp 1-4 (20)	
17		<b>Call For Dehumidification, No Cooling Demand</b>	BPT to set indoor space temperature setpoint (override) to current indoor space temperature (actual).  Actual Temperature = ____ F DB  Temporary Override = ____ F DB  FPT tester to set space dehumidification setpoint 10% below the actual space RH  Actual RH = ____ % RH  Temporary RH Override = ____ % RH	Cooling stage 1 disengages.  1st stage compressor operates, supply air blower operates at high cooling speed, and the reheat valve is energized.  Any of the copper loops on the reheat coil can be checked to see if temp rises upon call for dehumidification. (Reference Appendix for Images)	On the CORE controller the dehumidification set points can be adjusted. Reference Appendix.
18		<b>Call For Dehumidification, With Cooling Demand</b>	BPT to set indoor space temperature setpoint (override) to current indoor space temperature (actual) minus minimum 1.0F DB.	All compressors operate, supply air blower operates at high cooling speed and the reheat valve is energized	
19		<b>All Stage Cooling in Demand With A Call For Dehumidification (Applicable on Multi Stage Units)</b>	BPT to increase the indoor space temperature setpoint (override) to current indoor space temperature (actual) minus minimum 1.0F  BPT to reset OAS "Outside Air Suitable" parameters. Release all overrides, set dehumidification set point to 50% for non-BACnet units.	All compressors operate, supply air blower operates at high cooling speed, and the reheat valve is de-energized	
20		<b>CO2 Control</b>	BPT to check the current indoor CO2 reading  FPT tester to record indoor space CO2 level => ppm ____  CO2 setpoints are internal to the RTU Controller. Verify operation with WM BPT prior to travel; FPT tester to verify CO2 operation by breathing on sensor or other means.	Current Proto design RTU schedule includes note A which states the economizer damper is fully open to 100% outside air at 1100ppm CO2 and closed to minimum outside air position (or fully closed) at 1000ppm CO2	Setpoint = 1100ppm Range = 100ppm
21		<b>CO2 High Level Alarm</b>	BPT to verify that CO2 is inactive. This allows the RTU Controller to control the fan/damper and is the standard setting. BPT override the 60 min alarm delay 6 sec.  The FPT tester to blow on the sensor to increase the CO2 level.  BPT release override.	Fan energizes and economizer damper starts to open.  BPT confirms the alarm CO2 reaches 1400 ppm for 6 sec.	Note: If the test is not successful, BPT verify that the correct program is loaded from Novar. If so and the alarm still doesn't work, Lennox will need to confirm parameter settings on site.

#	Pass/Fail	Operation Tested	FPT Override: <i>When test is complete, release all overrides</i>	Expected Results	Notes
22		CO2 Sensor Function	BPT confirm CO2 readings for all RTUs with CO2 sensors not previously tested.	CO2 readings similar to tested RTU.	This is tested one time for all AHU and RTUs.
23		Refrigerant Leak Detection System (RDS) Test	FPT Tester to initiate Refrigerant Leak Detection System Test by using the following mobile service app menu path:  RTU Menu > Component Test > Leak Detection > Start Test (Reference CORE Controller App in Appendix)	The indoor blower and outdoor fan are energized.	
24		<b>Loss of Power</b>	FPT tester turn off power at unit disconnect.	RTU goes through normal shutdown operation, BAS creates a critical alarm to Monitoring, BPT observes unit shut down.	Monitoring should receive alarm within 4 minutes. BPT observation of unit shut down and verification of alarm programming is sufficient for test to Pass.
25		<b>Return of Power</b>	FPT tester turn on power at unit disconnect.	RTU goes through normal start-up operation and system returns to normal operation, BPT observes unit start-up.	

DI 31229 - Update Walmart Mechanical and Refrigeration FPT Processes.

CI 32089 - Update Proto RTUs and AHUs to 454B Refrigerant and Add Required BAS points – August 2024

## Appendix

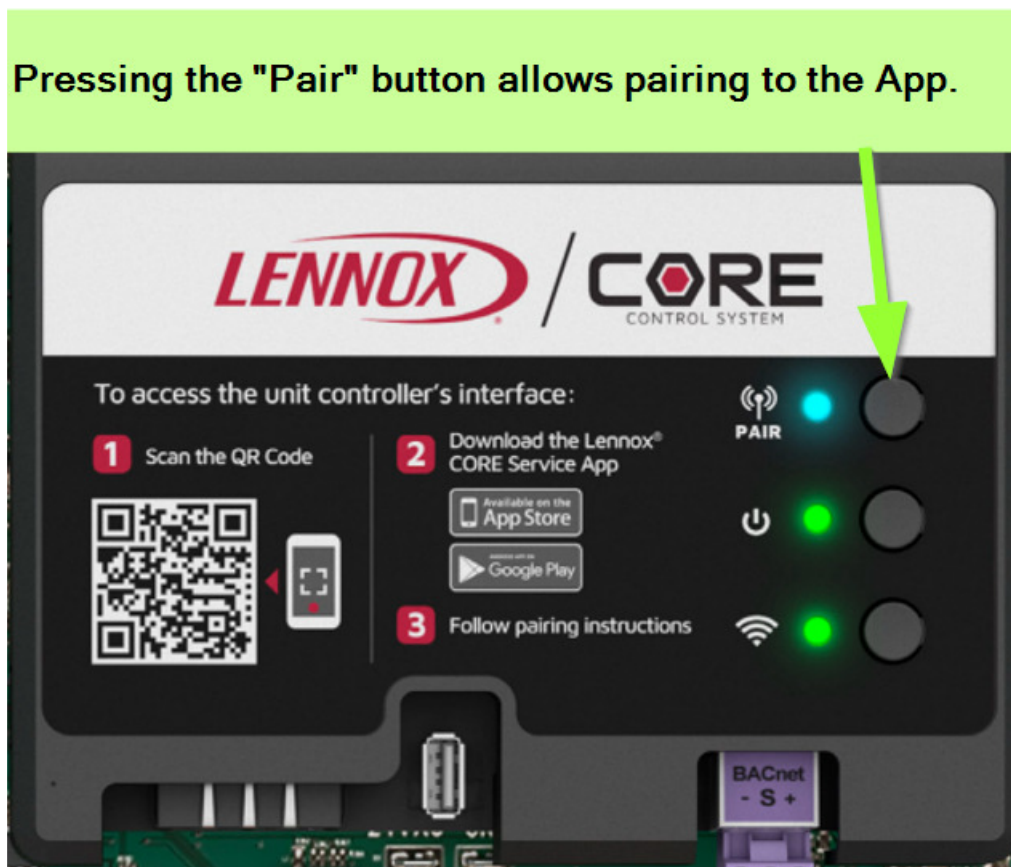
Refer to the Lennox Installation Instructions Manual furnished with the unit and located in the controls compartment for additional information. Also refer to the back of this manual for a summary and refer to the error codes placard displayed on the inside of the compartment door.

### **Scanning the QR code From the Installation Instructions Manual enables uploading the CORE Service Lennox APP.**

**Use this QR code to download the mobile service application. Follow prompts to pair the app with the unit control system and configure the unit. This QR code is also available in the unit control area.**



**Pressing the "Pair" button on the Wireless Control (W4) allows pairing to the App. The mobile application can discover the CORE Unit Controller if within 50 feet of the mobile device being used. Once the unit has been selected, connection should be established to your device within 10 seconds.**

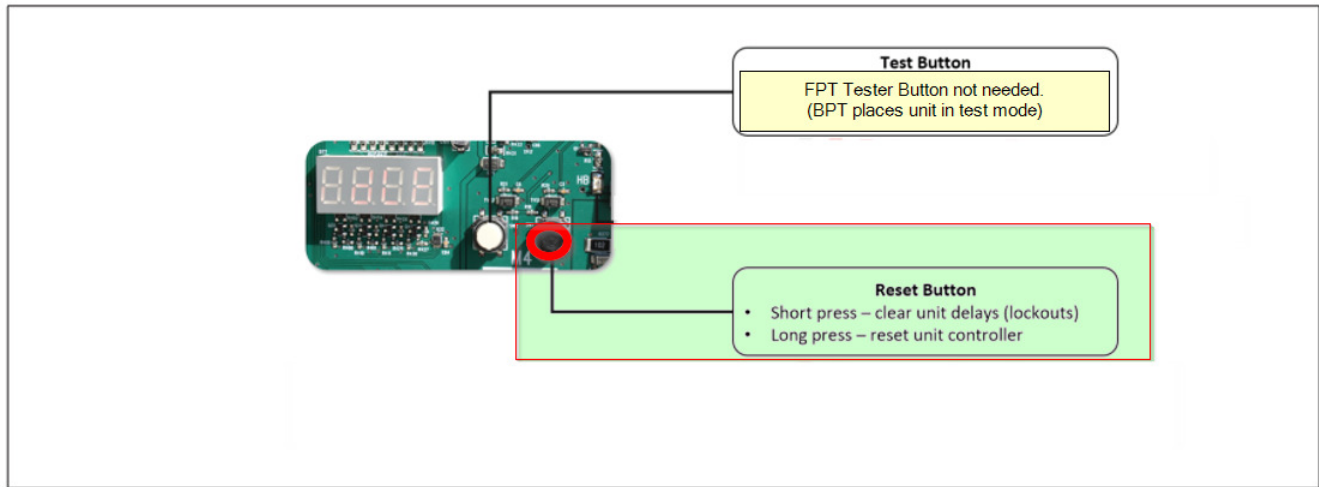


### **Reset Delay Button on CORE Unit Controller (A55)**

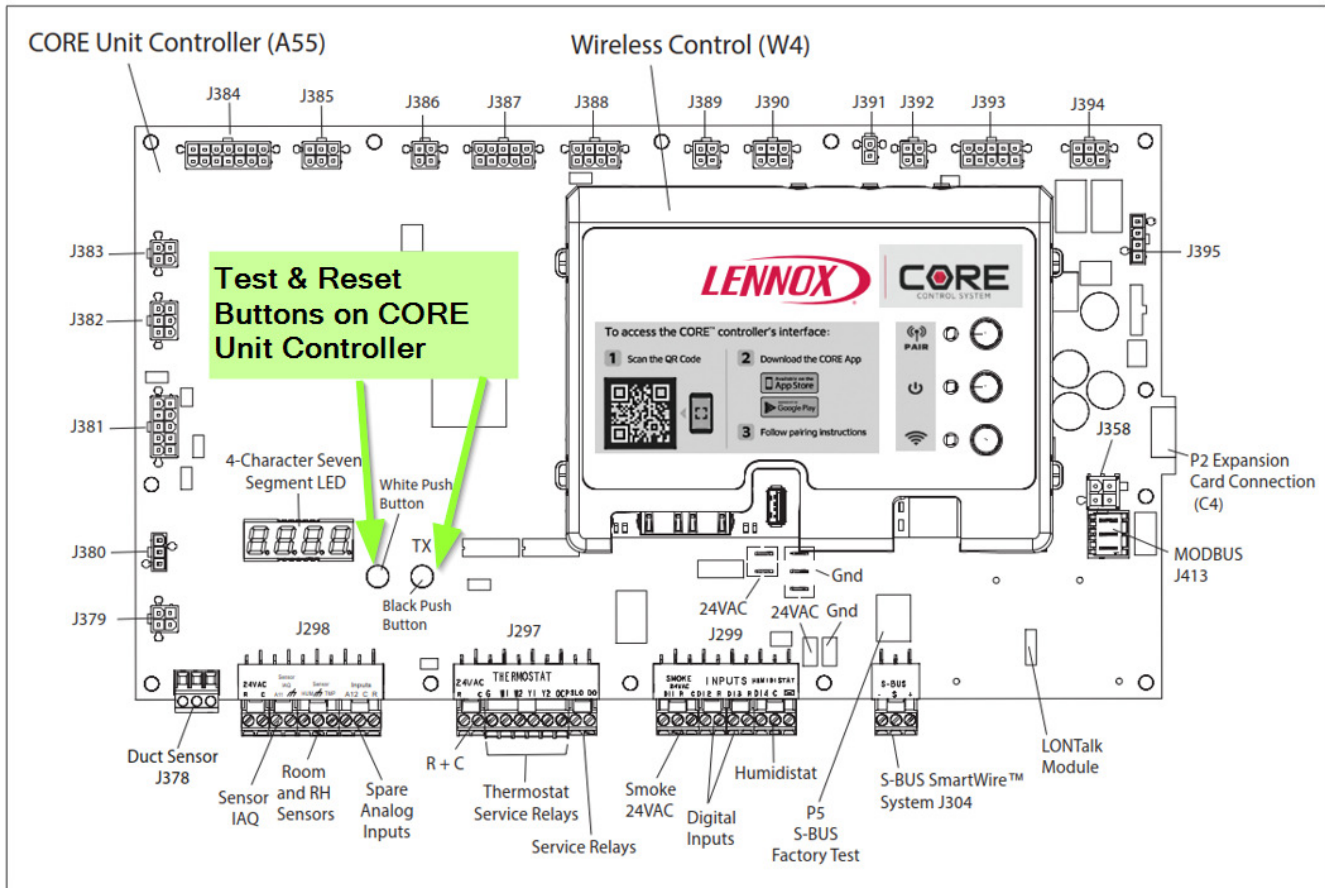
APP B-57

- **Reset button**
    - Short Press – Clears unit delays (lockouts)
- (Test button: BPT will put in test mode. FPT tester does not need to use Test button)

**F. LOCAL INTERFACE - PUSH BUTTONS**



**Figure 2. Push Buttons**



**Adjusting Dehumidification setpoint on CORE Controller:**

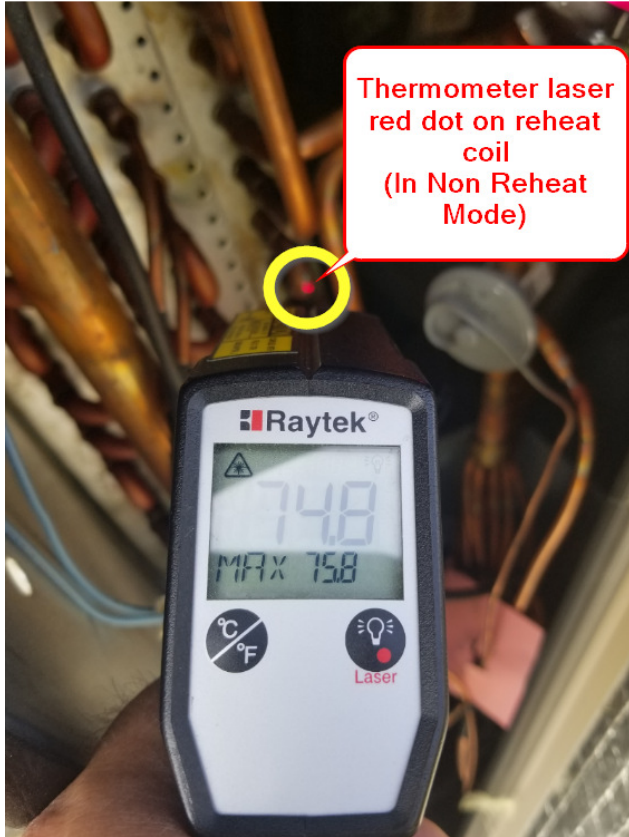
To change the Dehumidification Set Point on the CORE Service App, follow these steps:

APP B-58

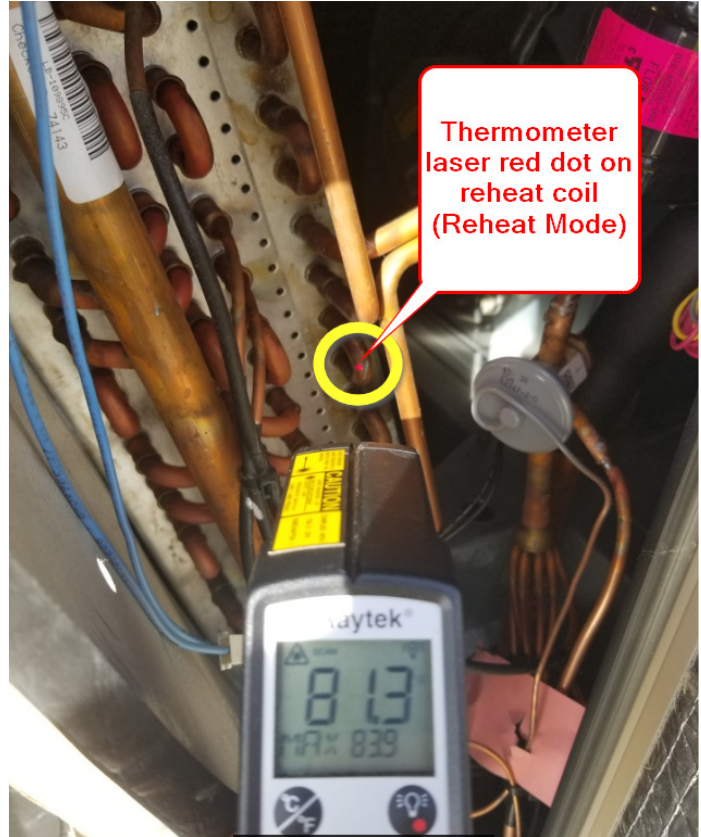
RTU OPTIONS > EDIT PARAMETER > SEARCH (Search for “106” which is the CORE Control System Unit Parameter for the Dehumidification Setpoint)

**Confirming Reheat Coil is Energized**

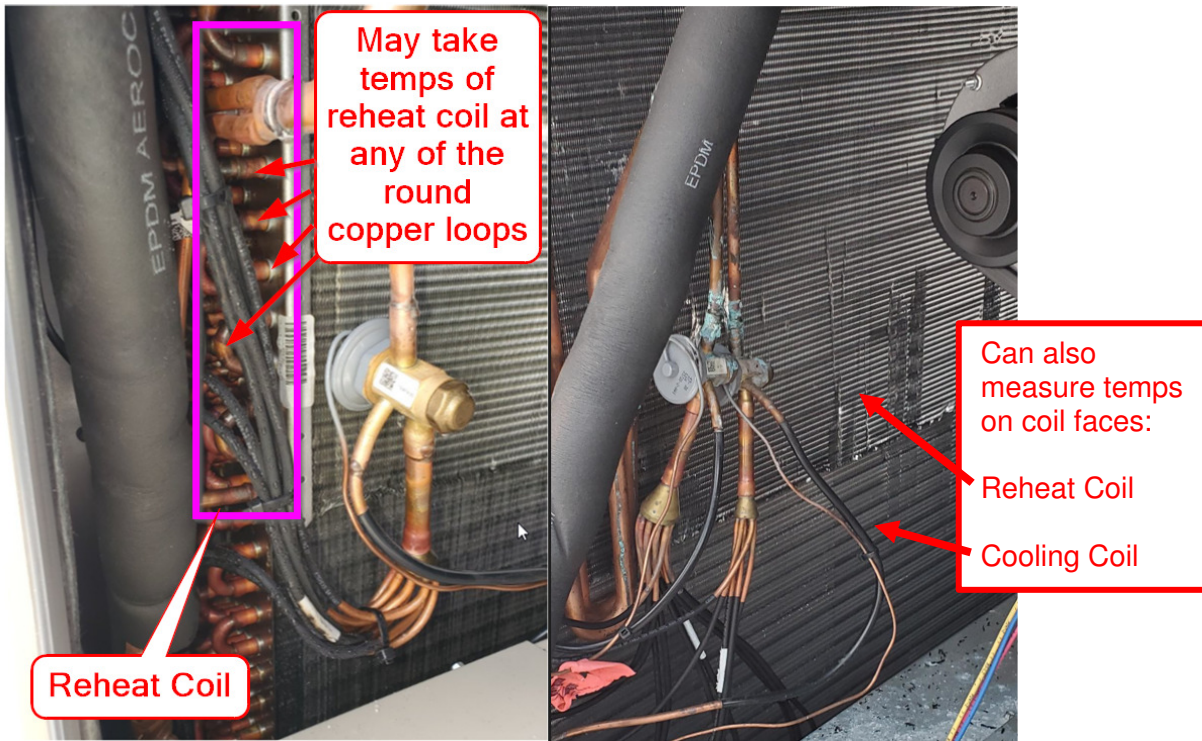
Any of the copper loops on the reheat coil or reheat coil face can be checked to confirm coil temp rises upon call for dehumidification.



**UNIT IDLE**



**UNIT IN DEHUMID MODE**



STRATEGOS 2.0 RTU WITH HUMIDITROL REHAT COIL LOCATION

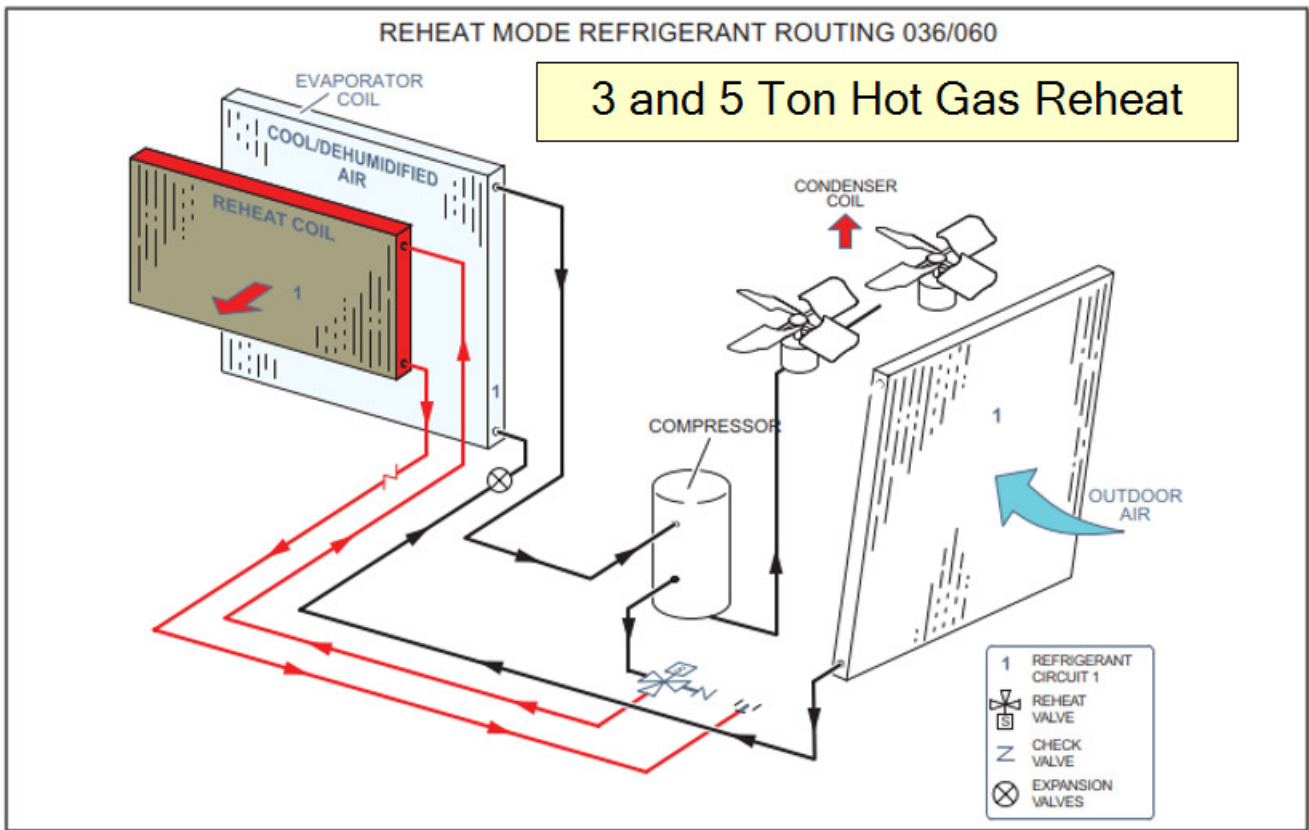
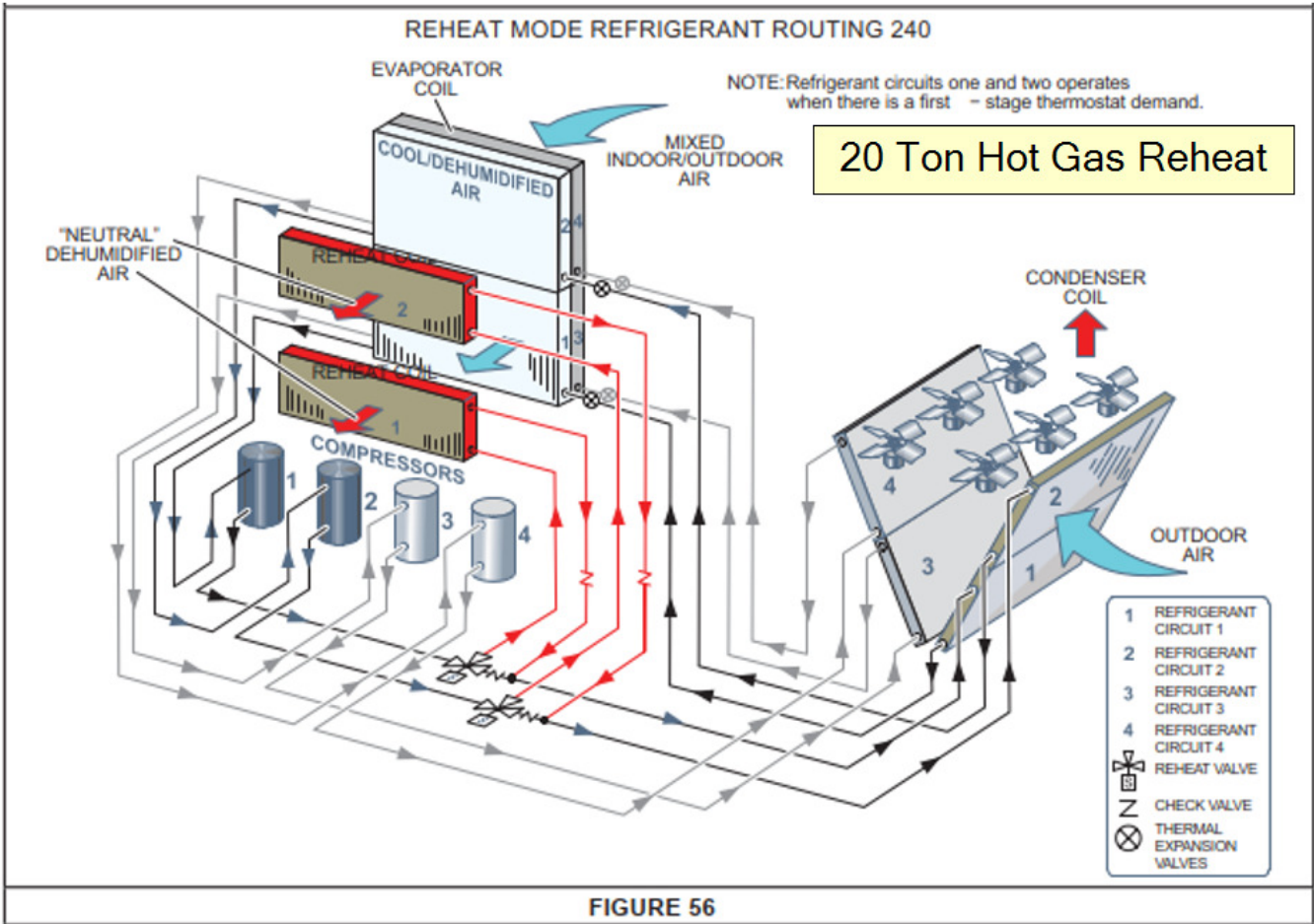
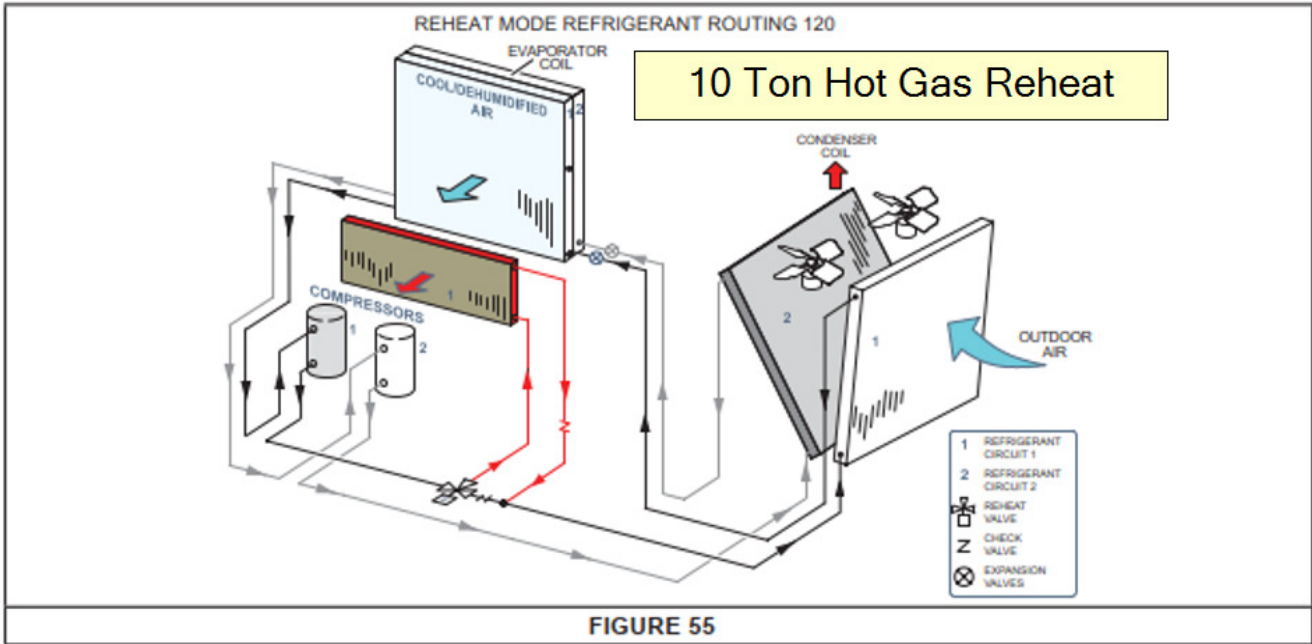


FIGURE 54



**Standard Internal RTU Protections**

1. Cooling System operating range of 0 degrees F - 125 degrees F (-18 - 52 degrees C) with RTU Controller
2. Compressor Controls:
  - a. For 3 phase units, minimum compressor on time of 240 seconds
  - b. Compressor lock out setpoint at 45 F
  - c. Low pressure controls lock out compressors and activate digital output for service if low pressure switch trips 3 times during one cooling cycle
  - d. Freezestats shut off compressors if freezestat trip occurs.
  - e. Freezestats lock out compressors if freezestat trip occurs 3 times during cooling demand.

END OF FORM "WALMART ROOFTOP UNITS – LENNOX STRATEGOS S SERIES HUMIDITROL PRODIGY 2.0 DX COOL, DEHUMIDIFICATION, MSAV (MULTI-STAGE AIR VOLUME) FUNCTIONAL PERFORMANCE TEST" AND APPENDIX



## *Walmart Building Performance Verification Program*

### **Walmart HFC RACK - Functional Performance Test**

Store No., City, and State: \_\_\_\_\_

Date and Time of Test: \_\_\_\_\_

Equipment Tag (Area Served): \_\_\_\_\_

Equipment Type: \_\_\_\_\_

Manufacturer and Model: \_\_\_\_\_

Name and Organization of Testing Person: \_\_\_\_\_

**CONTACT WALMART ALARM AT [nsrm@WalMart.com](mailto:nsrm@WalMart.com) PRIOR TO FPT TO NOTIFY THAT REFRIGERATION SYSTEM ALARMS MAY BE SUPRESSED DURING TESTING**

**PRIOR TO SCHEDULING SITE VISIT CONFIRM THE FOLLOWING:**

- **Verify the contractor hand off document is completed**
- **Verify OEM startup testing has been completed**
- **Confirm IOT/Network Connectivity**
- **Coordinate Refrigeration Contractor Availability on Site – Minimum of 2 Weeks prior to FPT**
- **Confirm with WMT Construction Manager approval of site visit schedule**

#	Pass/Fail	Operation Tested	FPT Override: <i>When test is complete, release all overrides</i>	Expected Results	Notes
1		REMOTE MONITORING	Request the follow remote monitoring data points to review remote connectivity and initial contractor startup is completed:  Alarm History Discharge Pressure Ambient Temperature Suction Pressure Temp Rack Superheat Rack Receiver Level Compressor Starts Condenser Fan Speed Condenser Split	REOR shall be given remote access to review and download points prior to the FPT.  REOR shall review minimum of 1 Week of data and make determination of whether system is operating within acceptable parameters per WM specifications and OEM SOO.	
#	Pass/Fail	Operation Tested	FPT Override: <i>When test is complete, release all overrides</i>	Expected Results	Notes

2			<p>CASE AND WALKIN CONTROLLERS Prior to FPT Perform Remote Sporlan Tech Check AUTO FPT on each Walk-in or Case Controller.</p> <p>Once AUTO FPT is passed validate the following:</p> <p>Cases:</p> <ul style="list-style-type: none"> <li>• Set points</li> <li>• Superheat History</li> <li>• DAT History</li> <li>• Defrost History</li> <li>• Missing Parts/Pieces</li> <li>• Damage</li> <li>• Lighting</li> </ul> <p>Walk-ins:</p> <ul style="list-style-type: none"> <li>• Set points</li> <li>• Superheat History</li> <li>• RAT History</li> <li>• Defrost History</li> </ul> <p>Note any and all cases that fail and what the discrepancy is. Repeat test after programming modifications are completed by the contractor.</p>	<p>Each Should receive a pass</p> <p>Note any systems that fail and the reason for failure.</p> <p>&gt;85% of all controller shall be in a passed state prior to coordination of FPT with Contractor.</p>	<p>NOTE: Need to add process for KE2 and CC200, not sure if they can be done remotely)</p>
3		REFRIGERANT LEVEL	Verify that the refrigerant level in the receiver is above 30%.		
4		OIL LEVEL	Observe that the oil level on the oil reservoir has at least 1 ball floating. Ensure compressor all oil level sensors are full and level.		
5		CONTRACTOR HAND OFF DOCUMENTS	Review Contractor handoff documentation on site to double check any noted items that were deficient have been resolved	Review Construction Observations log and note any outstanding items	
6		RACK SUCTION PRESSURE ALARM	<p>Test the response of the Suction Pressure Alarm set points</p> <p>High Suction Pressure Record Current high suction pressure set point alarm limit: _____ PSIG</p> <p>Offset the high suction pressure set point limit to be below current suction pressure set point</p> <p>Low Suction Pressure Valve closed the suction inlet to the compressors and watch that the compressors trip off on low suction pressure alarm.</p>	<p>Observe Alarms is triggered</p> <p>Once High Suction Pressure Alarm is observed return suction pressure High Limit to normal. Compressors should re-stage.</p> <p>Once Low suction pressure alarm is observed the compressors should shut off. Re-open the suction line valve and compressors should begin to stage back on.</p>	
#	Pass/Fail	Operation Tested	FPT Override: <i>When test is complete, release all overrides</i>	Expected Results	Notes
7		COMPRESSOR STAGING	<p>Override suction pressure set points as necessary to witness:</p> <p>Record Active Rack Suction Set point prior to test: _____ PSIG</p> <p>Compressors Staging Down Change rack suction set point to be lower than current suction pressure Return rack suction set point to design set point and compressors should stage down</p> <p>Compressors Staging Up</p>	<p>Toggle compressors on/off and witness the next compressors staging on to meet load. Allow a minimum 30 second delay between turning any compressor on / off.</p>	

			<p>Change rack suction set point to be lower than current suction pressure Compressors should stage up to lower rack suction to new set point</p> <p>If not witnessed by above, ensure all Compressors are in sequence by toggling compressor on/off and watching reaction of stage up/ stage down.</p>		
8		DISCHARGE PRESSURE	<p>Record Active Rack Discharge Pressure high limit set point prior to test: _____ PSIG</p> <p>Override discharge pressure high limit low enough to confirm that the compressors shut down on high discharge pressure.</p> <p>Return Active Rack Discharge Pressure High Limit to previous set point and watch the rack staging recover to maintain</p>		
9		COMPRESSORS	<p>Verify compressor starts count is reasonable under 75 Per day LT and 100 Per Day MT</p> <p>Verify Compressor sizes, models, and/or unloaders installed match what is programmed in the rack controller.</p>		
#	Pass/Fail	Operation Tested	FPT Override: <i>When test is complete, release all overrides</i>	Expected Results	Notes
10		CONDENSER	<p>Record Active Condenser Discharge Pressure Set point: _____ PSIG</p> <p>Condenser Fans Staging Down Condenser Fans Staging Up</p> <p>Record Active Split Condenser Ambient Temperature: _____</p> <p>Split Condenser Engage Split Condenser Valve Operation Split Condenser Disengage</p> <p>For Condensers with variable speed fans confirm that the parameters in the VFD are ramping fan speed to maintain design condensing TD to ambient (Typically 10F LT and 15F MT)</p> <p>Confirm Fan Rotation: _____</p> <p>Confirm Air Flow Direction: _____</p>	<p>Override discharge pressure set point to lower than currently observed, then observe fan speeds increase to meet lower set point.</p> <p>Override discharge pressure set point to higher than currently observed, then observe fan speeds decrease.</p> <p>Override Split Condenser ambient air temperature to be above current ambient. Condenser should go into split, test solenoid with magnet to ensure disengaged split valve.</p> <p>Override Split Condenser ambient air temperature to be below current ambient, then test solenoid. Should return to full condensing.</p>	
11		HOLDBACK VALVE	<p>Move remote display panel as needed to Holdback Valve Controller</p> <p>Login to the Carel Subcooler Controller (PSWD 0066)</p> <p><u>Under configuration Menu Validate:</u> Refrigerant Type Valve Type – (Carel) Sensor S1 – Pressure Sensore (0-34.5) Sensor S3 - Pressure Sensor (0-34.5)</p> <p><u>Under Regulation Menu Validate:</u> Hot Gas Bypass Regulator Setpoint (135 PSIG)</p>		

			Min Liquid Level % Set point (15%)		
12		SUB-COOLER	<p>Move remote display panel as needed to Subcooler Controller</p> <p><u>Under configuration Menu Validate:</u>  Refrigerant Type  Valve Type – (Carel)  Sensor S1 – Pressure Sensor (-1-12.5 Barg)  Sensor S2 - Disabled</p> <p><u>Under Regulation Menu Validate:</u>  Super Heat Setpoint (10F)</p>		
#	Pass/Fail	Operation Tested	FPT Override: <i>When test is complete, release all overrides</i>	Expected Results	Notes
13		VISUAL OBSERVATION	<p>Visually inspect all Walk-in Unit Coolers</p> <p>Ice –Build Up  Damage  Doors  Infiltration</p> <p>FLIR? – Good question if we should take any thermal scans to determine air infiltration etc.</p>	<p>Review CM observation log to determine if any deficiencies from the punch list still remain.</p> <p>Take photos of all Walk-in’s to document conditions.</p>	
14		VISUAL OBSERVATION	<p>Visually Inspect all BAS System installation per as-built drawings:</p> <p>Backboards  Supervisory Controllers and Accessories  Circuit Controllers  Leak Detection</p>	<p>Review CM observation log to determine if any deficiencies from the punch list still remain.</p> <p>Take photos of all to document installation and conditions.</p>	
15		VISUAL INSPECTION	<p>Visually Inspect All HFC Piping systems and note any deficiencies:</p> <p>Exterior - Insulation and Sleeves  Exterior - Penetrations  Exterior - Piping Supports  All - Suction Traps  All - Supports  All - Tidiness  All - Defects and Damage  All - Leaks  Interior - Insulation  Interior – Drains</p> <p>REOR is to review the construction observation log and evaluate if all items have been completed from the punch list.</p> <p>REOR to provide series of photos to not conditions during visual inspections noted.</p>	<p>Insulation and PVC sleeves are installed where specified.  Wall and roof penetrations are neat and water-tight.</p> <p>All exterior piping refrigeration drawings are supported as specified.</p> <p>Suction traps (base traps, inverted traps, and intermediate traps) are installed everywhere specified.</p> <p>All vertical and horizontal piping is supported per specifications.</p> <p>All pipes, insulation, and supports have a tidy appearance, especially customer-facing piping.</p> <p>Piping is free of damage where Insulation is installed properly and where specified.</p> <p>Condensate drains and roof penetration drip pan drains are installed, sloped properly, insulated/heat taped where specified, terminated over drain with drain covers, and are free of leaks.</p>	

16		NORMAL OPERATION	<p>Place system into normal operation mode and verify that all Cases and Walk-ins are meeting desired set point</p> <p>Verify stable suction pressure control at rack SST. Perform verification with Tech Assist that the rack is performing normally prior to leaving site</p> <p>END REOR FPT TEST WITH ALL PASS</p>		
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END OF FORM "WALMART HFC RACK - FUNCTIONAL PERFORMANCE TEST"

**END OF FUNCTIONAL PERFORMANCE FORMS**

## APPENDIX B REFERENCES

- A. American Association of State Highway and Transportation Officials (AASHTO)
1. AASHTO R18 - Establishing and Implementing a Quality System for Construction Materials Testing Laboratories.
  2. AASHTO T164 - Quantitative Extraction of Asphalt Binder from Hot Mix Asphalt (HMA).
  3. AASHTO T166 - Bulk Specific Gravity (Gmb) of Compacted Hot-Mix Asphalt (HMA) Using Saturated Surface-Dry Specimens.
  4. AASHTO T245 - Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus.
  5. AASHTO T275 - Bulk Specific Gravity (Gmb) of Compacted Hot Mix Asphalt (HMA) Using Paraffin-Coated Specimens.
  6. AASHTO T308 - Determining the Asphalt Binder Content of Hot-Mix Asphalt (HMA) by the Ignition Method.
  7. AASHTO T312 - Preparing and Determining the Density of Asphalt Mixture Specimens by Means of the Superpave Gyrotory Compactor.
  8. AASHTO T318 - Water Content of Freshly Mixed Concrete Using Microwave Oven Drying (Formerly AASHTO TP 23)
  9. AASHTO T331 - Bulk Specific Gravity (Gmb) and Density of Compacted Hot Mix Asphalt (HMA) Using Automatic Vacuum Sealing Method.
- B. American Concrete Institute (ACI):
1. ACI 301 – Structural Concrete.
  2. ACI 305.1 - Hot Weather Concreting.
  3. ACI 318.14 – Building Code Requirements for Structural Concrete.
- C. ASTM International (ASTM):
1. ASTM C 31 - Making and Curing Concrete Test Specimens in the Field.
  2. ASTM C 39 - Concrete Specimens, Compressive Strength of.
  3. ASTM C 42 - Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
  4. ASTM C 129 - Non-Load-Bearing Concrete Masonry Units.
  5. ASTM C 138 - Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete.
  6. ASTM C 140 – Standard Test Method for Sampling and Testing Concrete Masonry Units and Related Units.
  7. ASTM C 143 - Standard Test Method for Slump of Hydraulic Cement Concrete.
  8. ASTM C 172 - Sampling Freshly Mixed Concrete.
  9. ASTM C 173 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
  10. ASTM C 174 - Standard Test Method for Measuring Thickness of Concrete Elements Using Drilled Concrete Cores
  11. ASTM C 231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
  12. ASTM C 318 - Gypsum Formboard
  13. ASTM C 1019 - Method of Sampling and Testing Grout.
  14. ASTM C 1064 - Standard Test Method for Temperature of Freshly Mixed Hydraulic Cement Concrete.
  15. ASTM C 1077 - Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation.
  16. ASTM C 1093 - Accreditation of Testing Agencies for Unit Masonry.
  17. ASTM D 422 – Standard Test Method for Particle-Size Analysis of Soils.
  18. ASTM D 698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort.
  19. ASTM D 1188 - Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Coated Samples.
  20. ASTM D 1633 - Compressive Strength of Molded Soil-Cement Cylinders.
  21. ASTM D 2487 - Classification of Soils for Engineering Purposes.
  22. ASTM D 2488 - Description and Identification of Soils (Visual-Manual Procedure).
  23. ASTM D 2726 - Standard Test Method for Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixtures.
  24. ASTM D 2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

25. ASTM D 3740 - Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
  26. ASTM D 3666 - Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials.
  27. ASTM D 5444 - Standard Test Method for Mechanical Size Analysis of Extracted Aggregate
  28. ASTM D 6938 - In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
  29. ASTM E 165 - Liquid Penetrant Examination for General Industry.
  30. ASTM E 329 - Agencies Engaged in the Testing and/or Inspection Of Materials Used in Construction.
  31. ASTM E 543 - Agencies Performing Nondestructive Testing.
  32. ASTM E 699 - Criteria for Evaluation of Agencies Involved in Testing, Quality Assurance, and Evaluating Building Components in Accordance with Test Methods Promulgated by ASTM Committee E-6.
  33. ASTM E 709 - Magnetic Particle Testing.
  34. ASTM E 1155 - Determining Floor Flatness and Levelness Using the F-Number System (Inch-Pound Units).
  35. ASTM F 1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate Of Concrete Subfloor Using Anhydrous Calcium Chloride
- D. American Welding Society (AWS):
1. AWS D1.1 - Structural Welding Code.
  2. AWS D1.3 - Structural Welding Code - Sheet Steel.
- E. Research Council on Structural Connections (RCSC):
1. RCSC Specification for Structural Joints Using ASTM A 325 or A 490 Bolts.
- F. Masonry Standards Joint Committee (MSJC):
1. TMS 402/ACI 530/ASCE5 and TMS 602/ACI 530/ASCE 6 - Building Code Requirements and Specifications for Masonry Structures.
- G. National Fire Protection Association (NFPA):
1. NFPA 70E -Standard for Electrical Safety in the Workplace.

[Example Letter of Conformance from Testing and Inspection Agency (CTL) - all items in parentheses are items to be edited for the project ]

[Mr. Construction Manager]

Walmart, Inc.  
702 SW 8<sup>th</sup> Street  
Bentonville, AR 72712

[Re: Supercenter (Store #xxx) - City, State]

[Dear Construction Manager:]

The purpose of this letter is to state to Wal-Mart, the Architect of Record and the Engineer of Record that, to the best of our knowledge, the construction on the above referenced project has been completed in substantial conformance with the approved Contract Documents and with the provisions of the applicable building code. In the capacity of owner's testing and inspecting agency, periodic reports as well as a final report have been issued. Those reports state that all of the on-site inspection and testing has been performed. Work requiring inspection was, to the best of the inspector's knowledge, in conformance with the approved plans, specifications, and applicable workmanship provisions of the code.

To our knowledge no outstanding items exist except as otherwise may be entered and shown on the WalMart Observation Log.

Sincerely,

[Testing and Inspection Agency]

[Include a seal, signature and date of signature]

cc: [ARCHITECT OF RECORD]  
[ENGINEER OF RECORD]